

# Integrated Branching City

Higher Diploma in Creative Media DE114102 2C1

## Our Team

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## Tutor

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## Special Thanks

Lawrence Choi  
MC Sun  
Eric Lee

Inspired by the current issues, we attempted to look for an ideal solution to ameliorate the problem of social instability. Consequently, we would like to pull ourselves or even the audience away from the real world, which is stretched by so many social problems. And we began our research with the word “virtual”, which has the opposite meaning of “real”.

# Definition

Exploring the meanings of “virtual”



## Research Data & Analysis of the Target Group

From the above 15 mental disorder, the characteristic of bipolar disorder patient will be the best fit for our project. Through our further research, we noticed that a fluctuating waves occurred by high frequencies may be found in patients with the bipolar depression with the use of electroencephalograph (EEG). The difference in EEG can symbolize our interpretation on the social disparting condition.

## Reference:

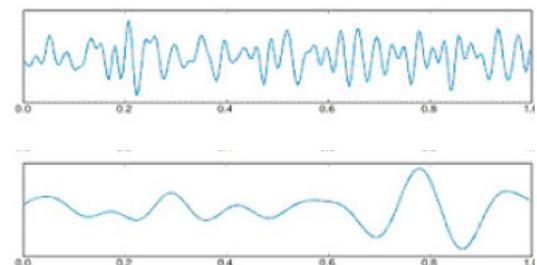
Diagnose Bipolar Disorder with an EEG

[http://www.ehow.com/how\\_5659607\\_diagnose-bipolar-disorder-eeg.html](http://www.ehow.com/how_5659607_diagnose-bipolar-disorder-eeg.html)

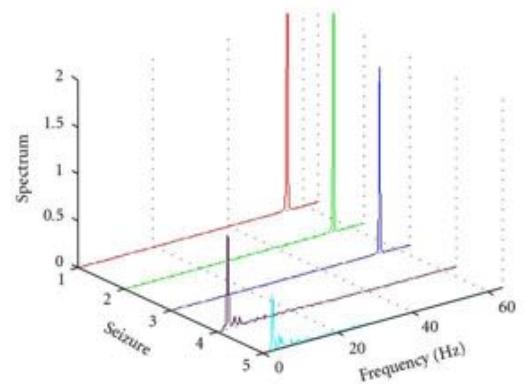
EEG Characteristics in Subgroups of Depressive Disorder  
in Patients Receiving Electroconvulsive Therapy

[http://publications.ki.se/xmlui/bitstream/handle/10616/41671/dissertation\\_benny\\_liberg.pdf?sequence=1](http://publications.ki.se/xmlui/bitstream/handle/10616/41671/dissertation_benny_liberg.pdf?sequence=1)

The difference found in the people with bipolar disorder (upper) and people without the disorders (lower) in the EEG



A high occurrence of high frequencies was found according to the research in patients



# Interview

Interview with Ph.D. Candidate



On 8th November 2013, we visited a PhD candidate from Department of Social Work & Social Administration, Mr. Nan Kin-man Joshua, who also is an art therapist, uses ceramics as a treatment for bipolar disorder patients. He shared his studies in EEG and his experience of having art therapy with his patients.

Before the meeting, we successfully connected the brainwave headset with Max 6; we, however, found that there are 10 types of data and each of them represents different parts of the brain. We are unable to identify which data is the most suitable one for our project.



Through our conversation with Mr. Nan, we were able to understand more about the current situation of bipolar disease patients and the difficulty of collecting the accurate EEG from them. Beside, we discovered the limitation of our brainwave headset. Comparing with the professional equipment, we are unable to collect precise data from the participant. Thus, we decided to focus on using the “attention” data to develop our work.

Findings:

- obstacle of visiting bipolar disease patients
- difficult to collect EEG data from patients
- accuracy of different EEG data collecting from the headset
- attention data is a more accurate set of data collected from the headset

[http://youtu.be/W4F\\_Y\\_LPuHU](http://youtu.be/W4F_Y_LPuHU)

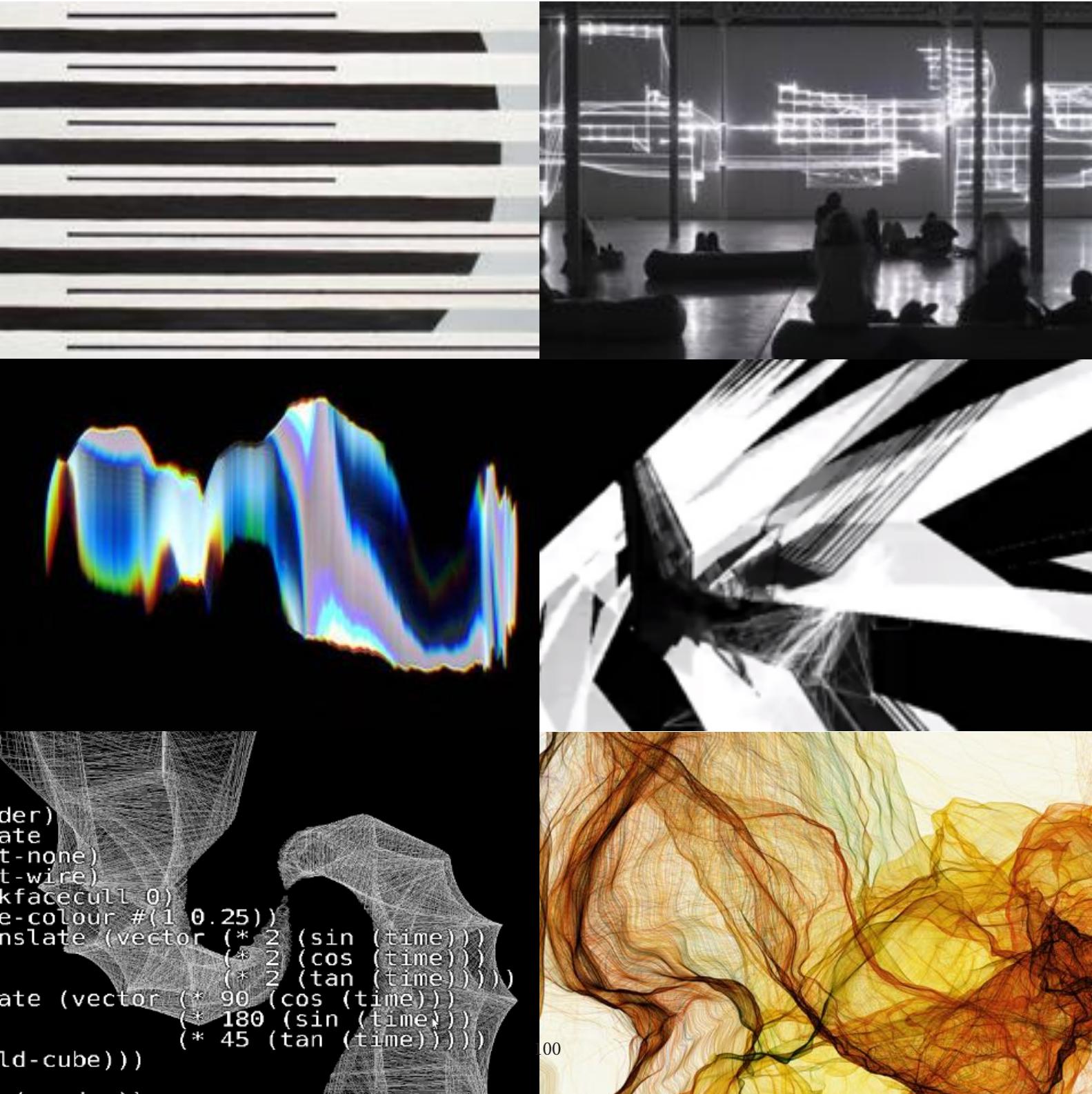


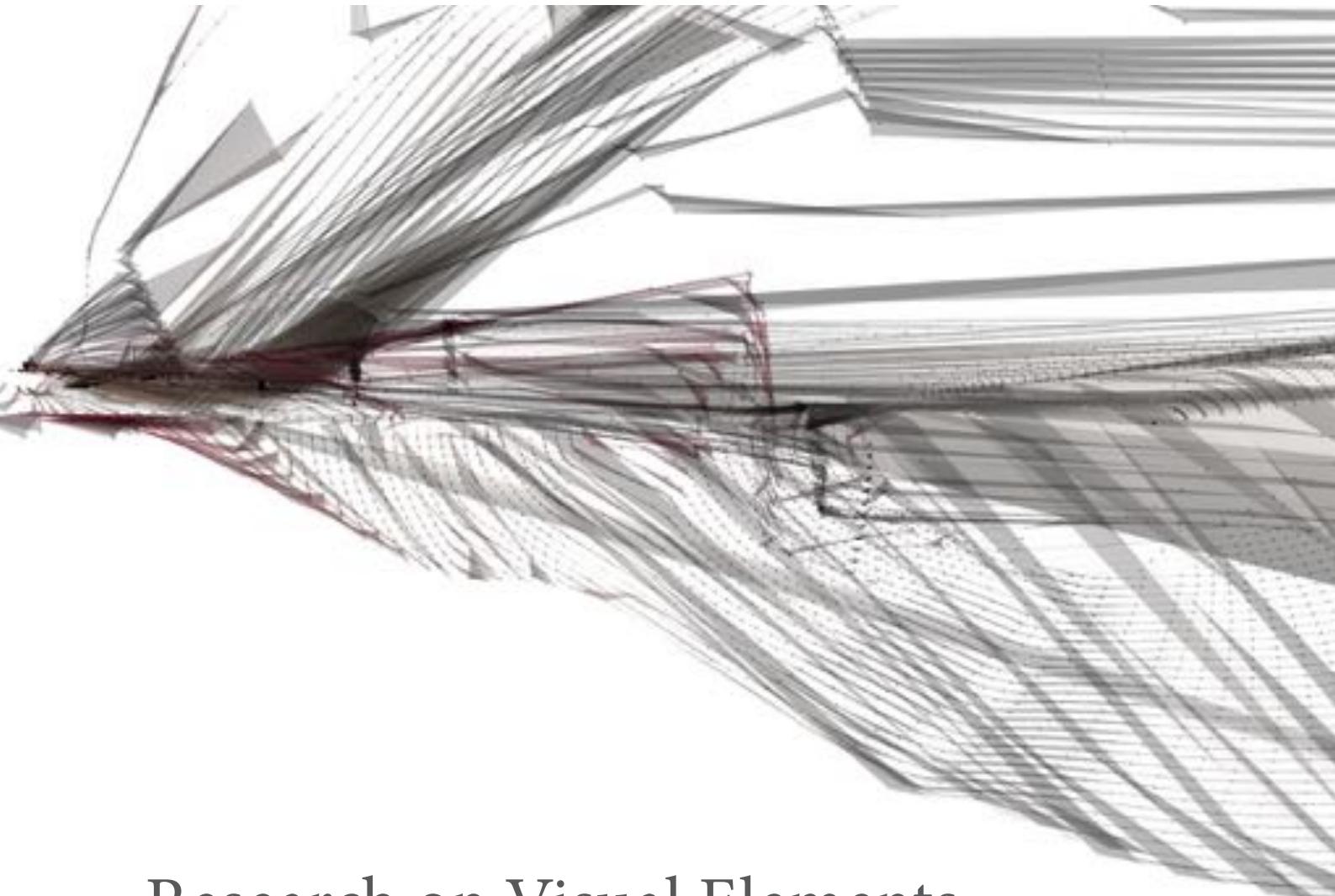




# Data Visualization

Possibilities of visualizing the data of the bipolar situation with fluctuating visual elements

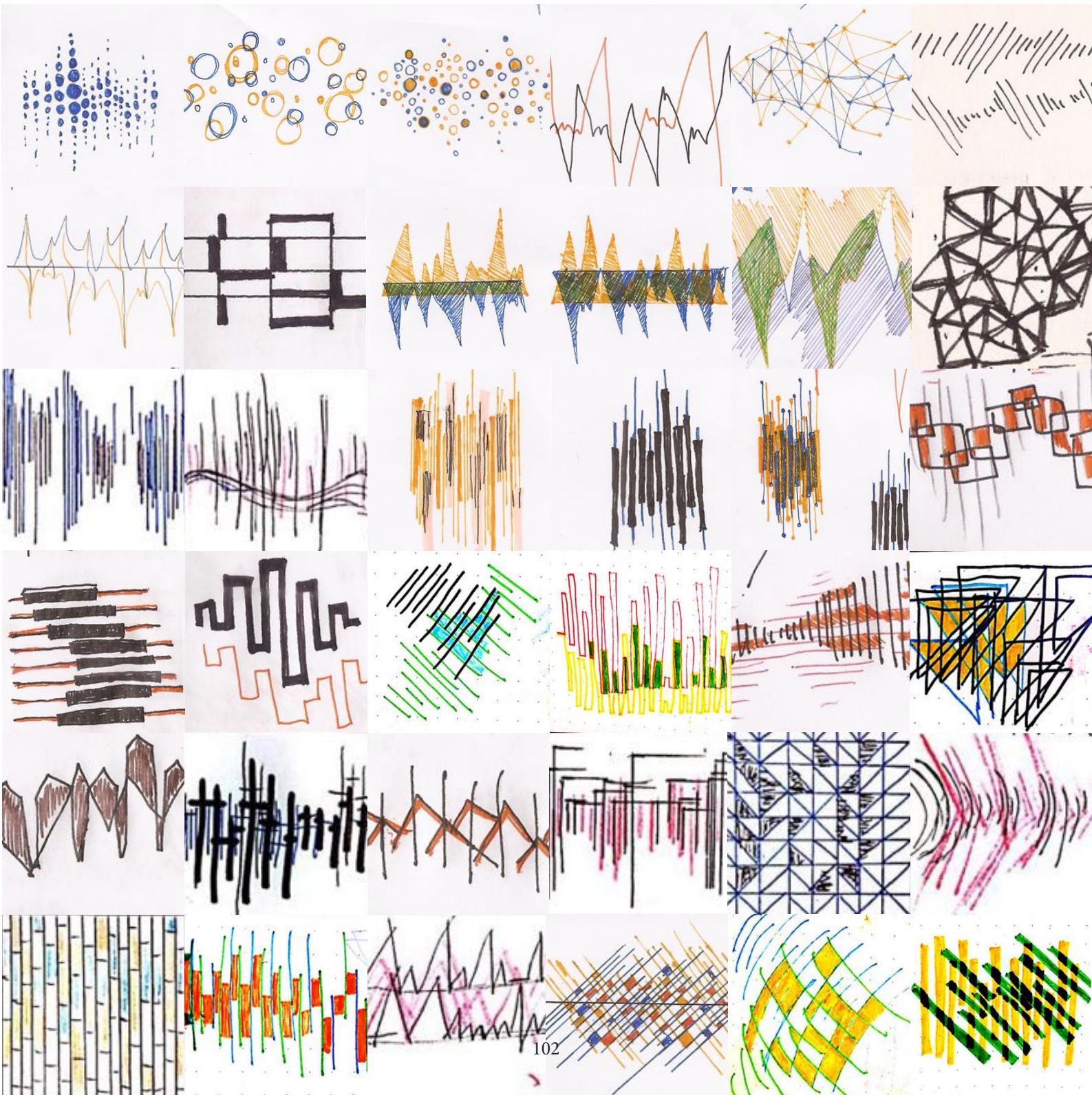




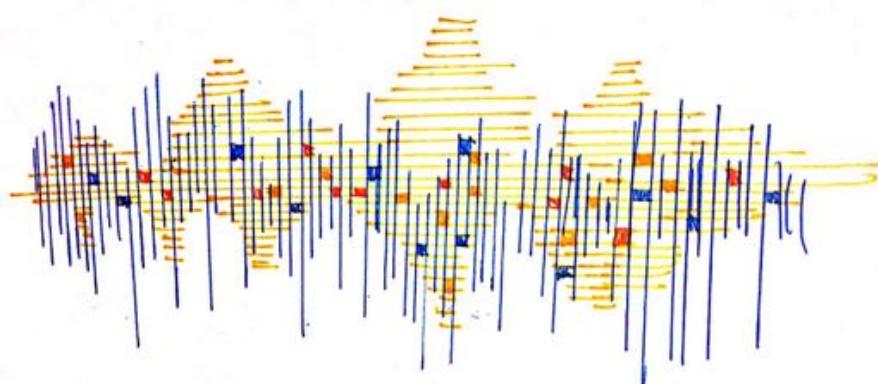
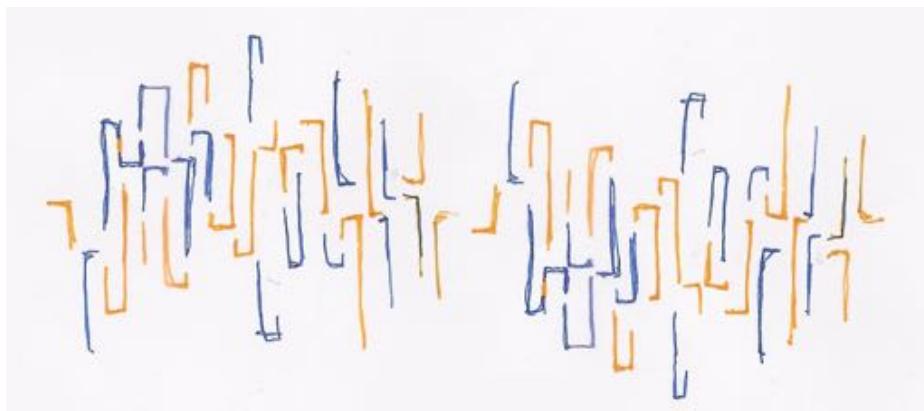
# Research on Visual Elements

Conducting a research based on our desired visual effects, we revealed the visual findings:

- Straight line
- Overlapping
- Rhythmic movement
- Pixelate

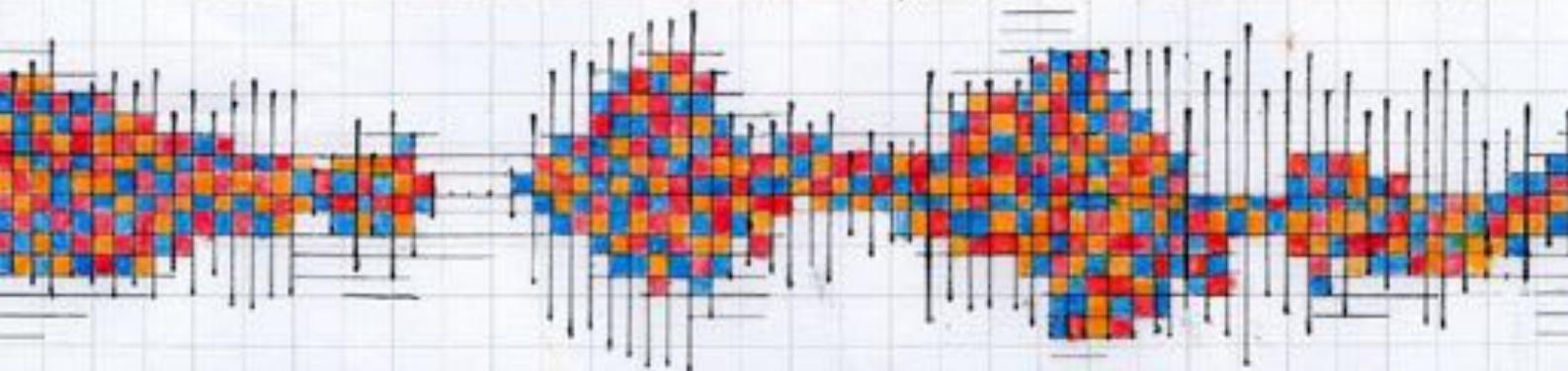
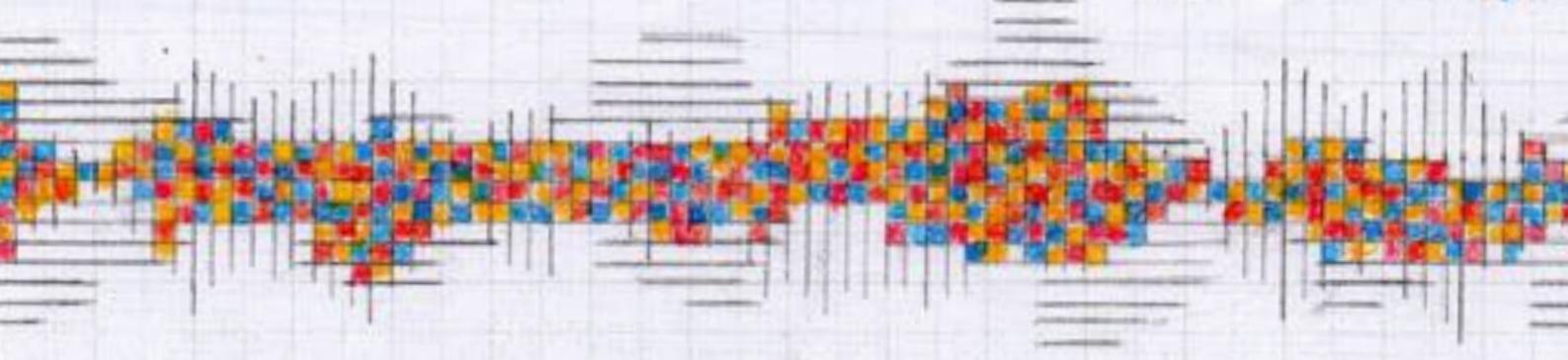
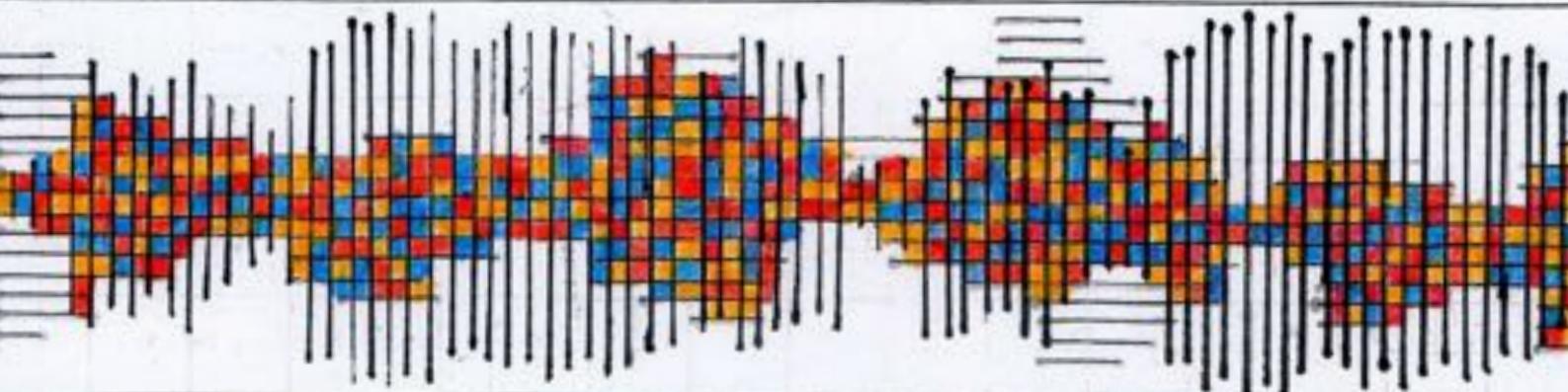
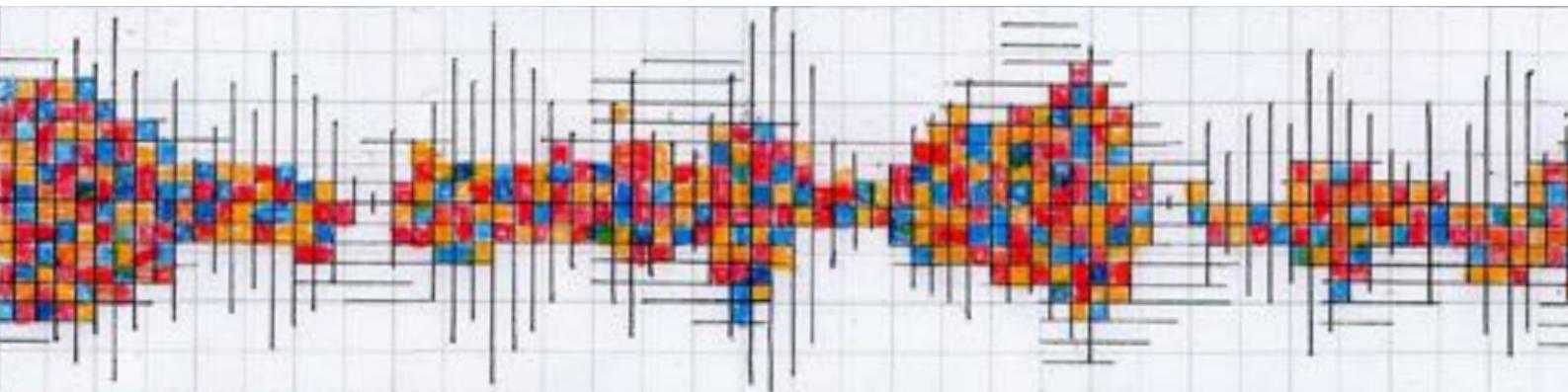


# Sketches and Exploration of Visual Elements



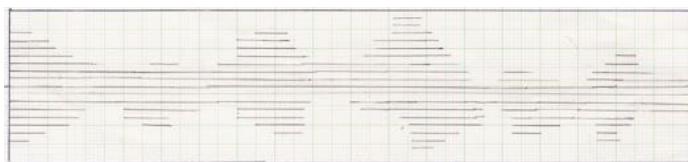
The three main colors, which were used in the final effects are:

- blue
- yellow
- red

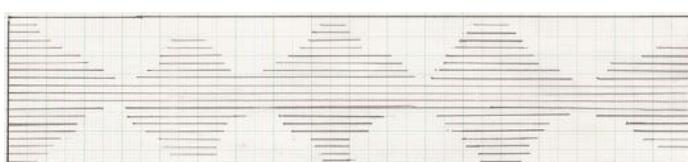


Simulate the Data

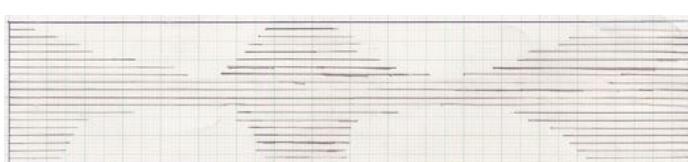
We pre-set 5 types of bipolar disorders' EEG data, which are created based on our research. These preset waves will be combined it with the EEG of each member to simulate the data visualization and find out the data capacity.



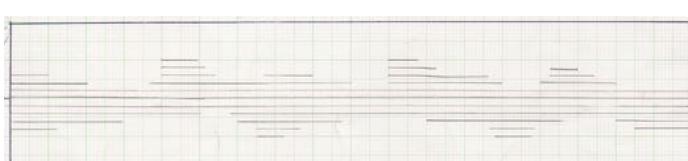
bipolar disorder pre-assumed wave 1



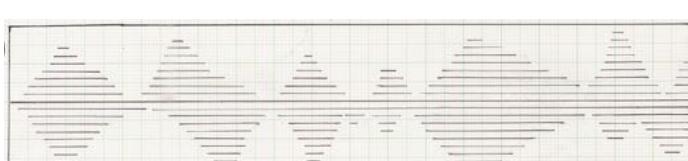
bipolar disorder pre-assumed wave 2



bipolar disorder pre-assumed wave 3



bipolar disorder pre-assumed wave 4



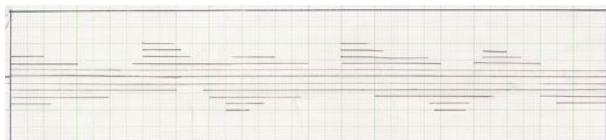
bipolar disorder pre-assumed wave 5

Pre-set EEG:

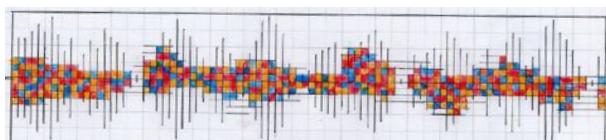
- Narrower shape
- Low contrast of sequence

Findings:

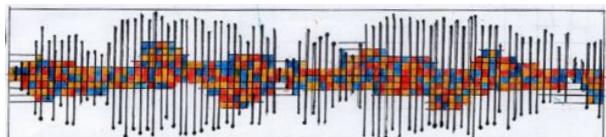
- Pattern of pixels are too stable
- Range of the frequency is not diverse
- Shadow-like effect cannot be formed
- Flat-top doesn't satisfy the desired visual effect



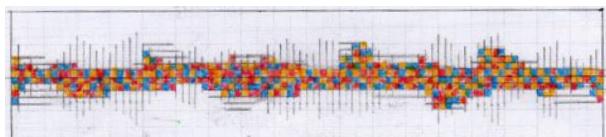
bipolar disorder pre-assumed wave 4



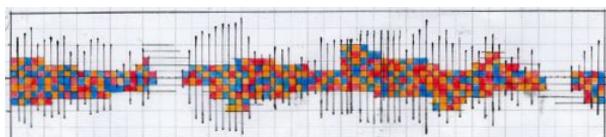
Fung Wing Lam's data visualization



Kwok Wan Ting's data visualization



Ngai Po Yiu's data visualization



Choi Ka Man's data visualization

Pre-set EEG:

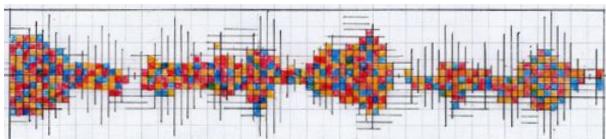
- Regular rhythm
- Wider range of sequence
- Low density

Findings:

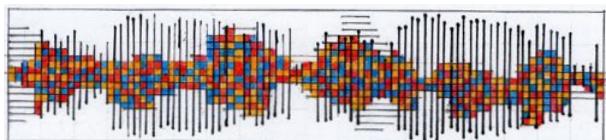
- Range of preset may be too sparse
- A city silhouette may be difficult to form
- Problem of flat-top is found



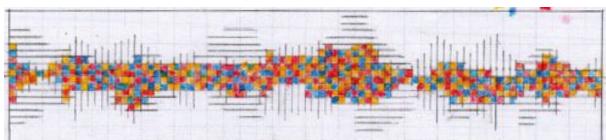
bipolar disorder pre-assumed wave 1



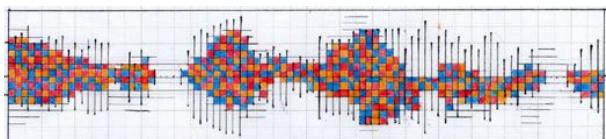
Fung Wing Lam's data visualization



Kwok Wan Ting's data visualization



Ngai Po Yiu's data visualization



Choi Ka Man's data visualization

Pre-set EEG:

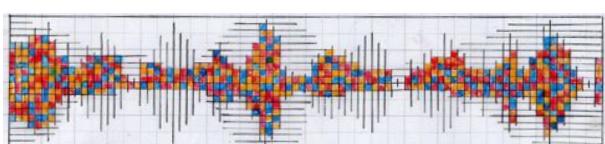
- Regular rhythm
- Wider range of sequence
- Low density

Findings:

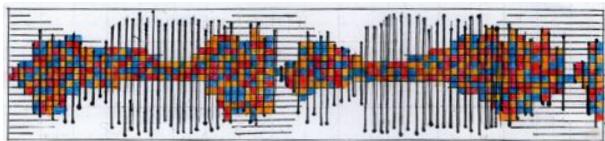
- Bottom part of the pattern is too flat
- Shadow-like effect cannot be formed



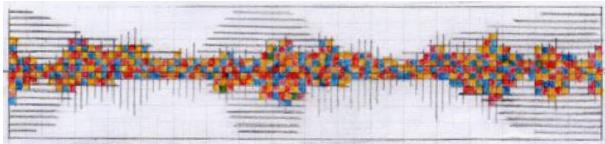
bipolar disorder pre-assumed wave 3



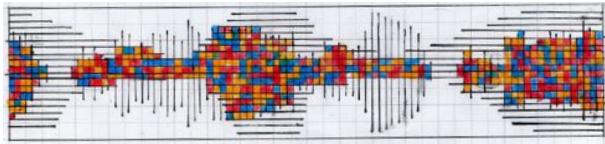
Fung Wing Lam's data visualization



Kwok Wan Ting's data visualization



Ngai Po Yiu's data visualization



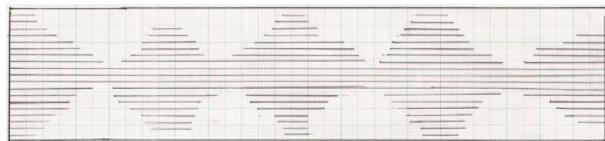
Choi Ka Man's data visualization

Pre-set EEG:

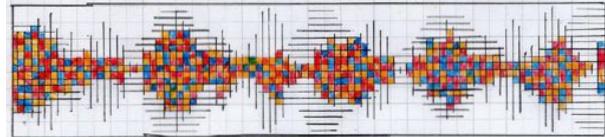
- Irregular rhythm
- Different range of sequence

Findings:

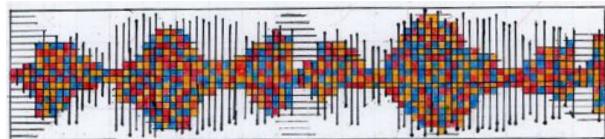
- Pattern are varied in range of rhythm
- Able to create a shadow-like effect
- Small contrast in shape



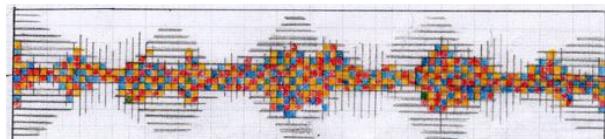
bipolar disorder pre-assumed wave 2



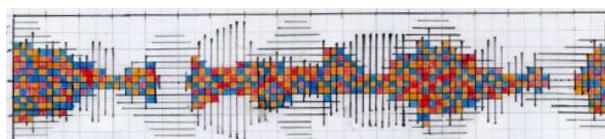
Fung Wing Lam's data visualization



Kwok Wan Ting's data visualization



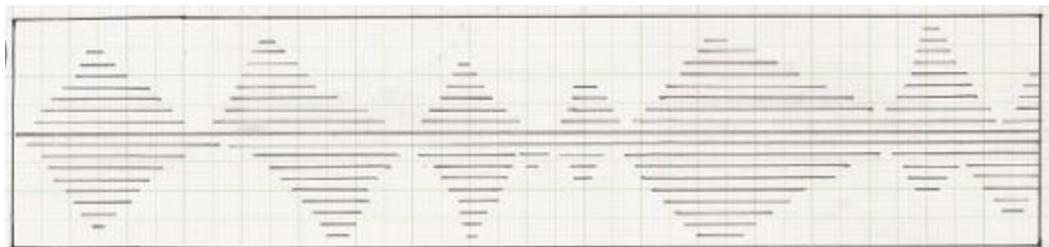
Ngai Po Yiu's data visualization



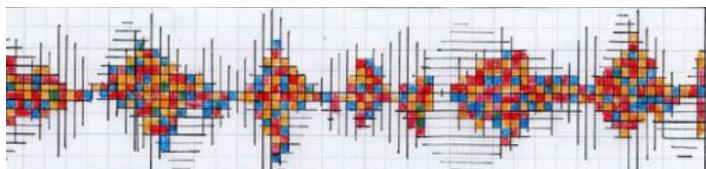
Choi Ka Man's data visualization

# Summary

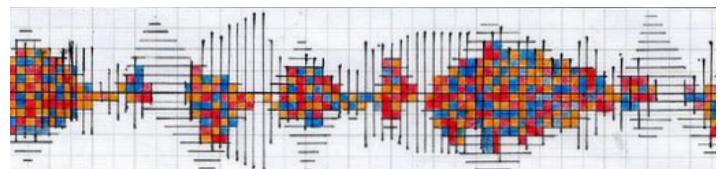
Referring to the result of the simulation, we found out that bipolar disorder pre-assumed wave 5 create the best effect. Irregular wide range of frequencies with high density is more reachable to get our desired visual effects. These characteristics will be used to develop more types of preset to find out the possibility on generating our visual effects in the program.



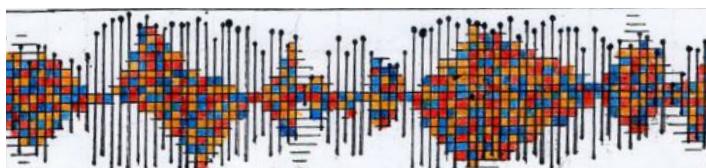
bipolar disorder pre-assumed wave 5



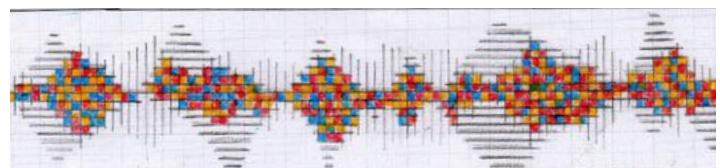
Fung Wing Lam's data visualization



Ngai Po Yiu's data visualization



Kwok Wan Ting's data visualization



Choi Ka Man's data visualization

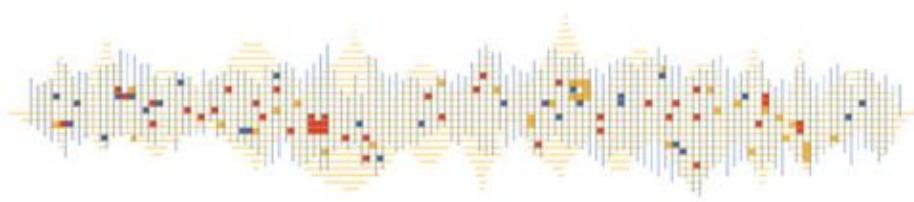
# Pre-visualization

Pre-visualize the Interactivity

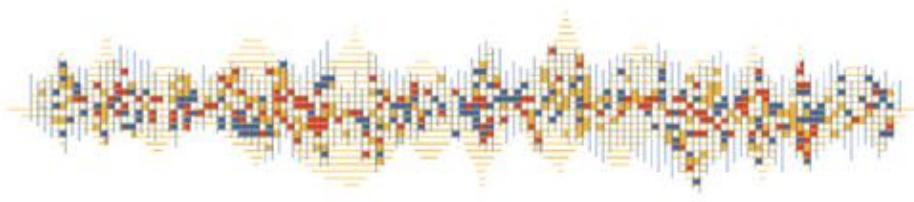
A new integrated cityscape silhouette is generated from stage to stage.



With a pulse-like dimming effect, a silhouette is shown after the analysis of the EEG data



The pixels started to be generated and shown on the grid



The lines which indicate the EEG will be faded out as more pixels are generated



The silhouette will keep  
dimming on the pixels



The city is formed with  
the pixels



Part of the pixel will be  
distorted like a shadow



# Programming Details

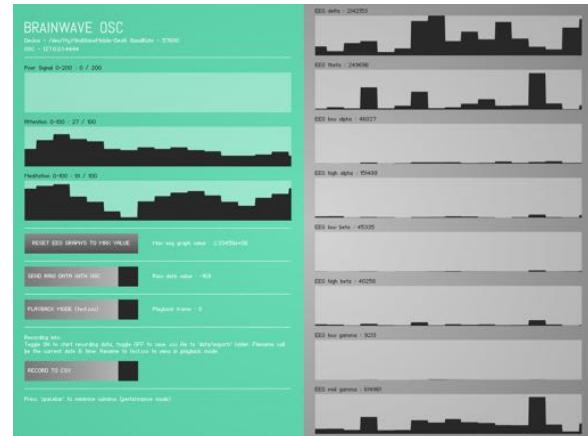
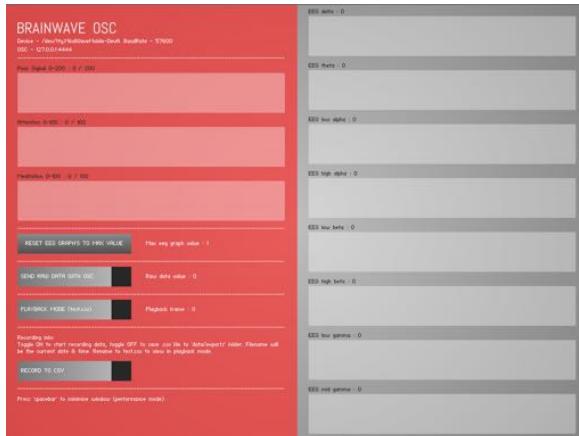
# Preparation

We decided to connect sensors and electronics with Max 6,  
so we have done a bunch of preparation works for  
developing the program.

# Electroencephalography (EEG)

In order to analyze the data, we will get the EEG data through Brainwave OSC.

Attention	0-100, 0=bad, 100=good
Mediation	0-100, 0=bad, 100=good
EEG delta	0.5-2.75Hz
EEG theta	3.5-6.75Hz
EEG low alpha	7.5-9.25Hz
EEG high alpha	10-11.75Hz
EEG low beta	13-16.75Hz
EEG high beta	18-29.75Hz
EEG low gamma	31-39.75Hz
EEG mid gamma	41-49.75Hz
Signal	0-200, 200=high noise, poor signal



- Use Bluetooth to connect with OSC to get the data of EEG.

  connecting / attempting

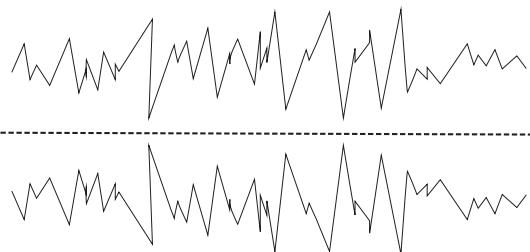
  connected

# Define Vertical Lines

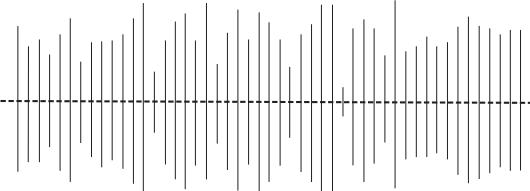
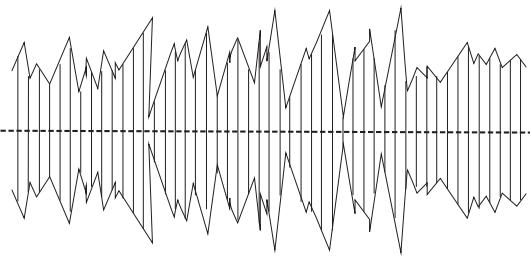
1. Basic data curve



2. Mirror effect:  
Basic number data duplicated



3. Show the line



# Data Analysis

As the development of our program requires a deeper research on the EEG data, we have to find out the possibilities of conditions that we may get from data.

We chose the data of attention for testing and discovered the varied changes in the data getting from the headset. Through a chain of methods, desired visual effects can be created.



# Data Analysis

According to the EEG data which is collected from the headset, we concluded that one data is updated in about a second.

This testing allows us to look for the relationship between the EEG data, and how the floating number may affect our program setting.

After the interview with Mr. Nan, we found out that the data of attention and meditation are more accurate comparatively. Therefore, we chose attention as the sensoring data for our work.

Time elapsed	Signal	Attention	Meditation	EEG delta	EEG theta	EEG low alpha	EEG high alpha	EEG low beta	EEG high beta	EEG low gamma	EEG mid gamma	
0.09-0.57 (0.54)	0 (↑)	1	66	17	420884	16779	5807	3124	903	1620	453	206
0.61-1.59 (0.98)	0 (↑)	69(↑)	66	30	361327(↓)	41017(↑)	12642(↑)	13085(↑)	12702(↑)	11485(↑)	12823(↑)	4436(↑)
1.63-2.54 (0.91)	0 1(↓)	69(↑)	66	28	13364566(↑)	132840(↑)	52346(↑)	50671(↑)	51295(↑)	24426(↑)	4642(↓)	10904(↑)
2.58-3.59 (1.01)	0	1 78(↑)	66	31	695124(↓)	94025(↓)	48422(↓)	24266(↓)	8730(↓)	48871(↓)	23881(↓)	1376(↓)
3.63-4.54 (0.94)	0	1 66(↓)	66	28	817124(↑)	65662(↓)	8367(↓)	7544(↓)	7694(↓)	3857(↓)	7122(↑)	1454(↑)
4.57-5.55 (0.98)	0	1 83(↑)	66	30	2589242(↓)	108758(↑)	148912(↑)	350051(↑)	6264(↓)	26382(↑)	39899(↑)	10649(↑)
5.59-6.53 (0.94)	0	1 75(↑)	66	29	1043350(↓)	35860(↓)	112779(↓)	8518(↓)	27028(↑)	7764(↓)	9640(↓)	1279(↓)
6.75-7.55 (0.8)	0	1 64(↓)	64	30	227280(↓)	19112(↓)	4812(↓)	2306(↓)	917(↓)	878(↓)	689(↓)	442(↓)
7.58-8.56 (0.98)	23(↑)	1	64	30	1322925(↓)	60499(↑)	4136(↓)	7832(↑)	9509(↑)	11140(↑)	1578(↑)	1043(↑)
8.59-9.54 (0.95)	25	1	64	29	654924(↓)	58612(↓)	2934(↓)	1744(↓)	1449(↓)	2139(↓)	176(↓)	360(↓)
9.57-10.52 (0.95)	25	1	64	29	1905128(↓)	491475(↓)	110163(↑)	35455(↑)	49681(↑)	7785(↑)	18549(↑)	21232(↑)
10.55-11.50 (0.95) 0(↓)	83(↑)	83(↑)	83(↑)	29	1977630(↑)	139063(↓)	15538(↓)	91449(↑)	13800(↓)	18396(↑)	12701(↓)	6219(↓)
11.54-12.52 (0.98)	0 1(↓)	70(↓)	64	30	1656452(↓)	94482(↓)	53675(↑)	17402(↓)	14668(↑)	12722(↓)	9842(↓)	5260(↓)
12.56-13.54 (0.98)	0 2(↑)	90(↑)	64	30	2787496(↑)	38858(↓)	41157(↓)	61626(↑)	34426(↑)	34862(↑)	9582(↓)	2970(↓)
13.57-14.51 (0.94)	26(↑)	7	90	29	94373(↓)	33373(↓)	4699(↓)	5334(↓)	6968(↓)	1799(↓)	308(↓)	161(↓)
14.55-15.50 (0.95)	53(↑)	7	90	29	979835(↑)	55727(↑)	36305(↑)	156861(↑)	15333(↑)	15347(↑)	11647(↑)	9835(↑)
15.53-16.48 (0.95)	51	7	90	29	1395128(↑)	393269(↑)	4115(↓)	64559(↑)	75344(↑)	67470(↑)	2758(↓)	6060(↓)
16.51-17.49 (0.98)	24(↑)	100(↑)	100	30	168422(↓)	17104(↓)	12189(↑)	13796(↓)	7388(↓)	8433(↓)	13547(↑)	6045(↑)
17.53-18.51 (0.98)	0 49(↑)	100	100	30	60484(↓)	4183(↓)	16621(↑)	5750(↓)	4314(↓)	17508(↑)	4741(↓)	3514(↓)
18.55-19.49 (0.94)	0 66(↑)	100	100	29	87801(↓)	8302(↑)	3745(↓)	8133(↑)	7066(↑)	9060(↓)	7919(↑)	2776(↓)
19.52-20.51 (0.99)	0 51(↓)	100	100	30	198173(↑)	50549(↑)	34251(↑)	38013(↑)	26141(↑)	7307(↓)	3510(↓)	6448(↑)
20.54-21.52 (0.98)	0 35(↓)	90(↓)	100	30	133804(↑)	46539(↓)	12930(↓)	6803(↓)	5681(↓)	3086(↓)	1771(↓)	435(↓)

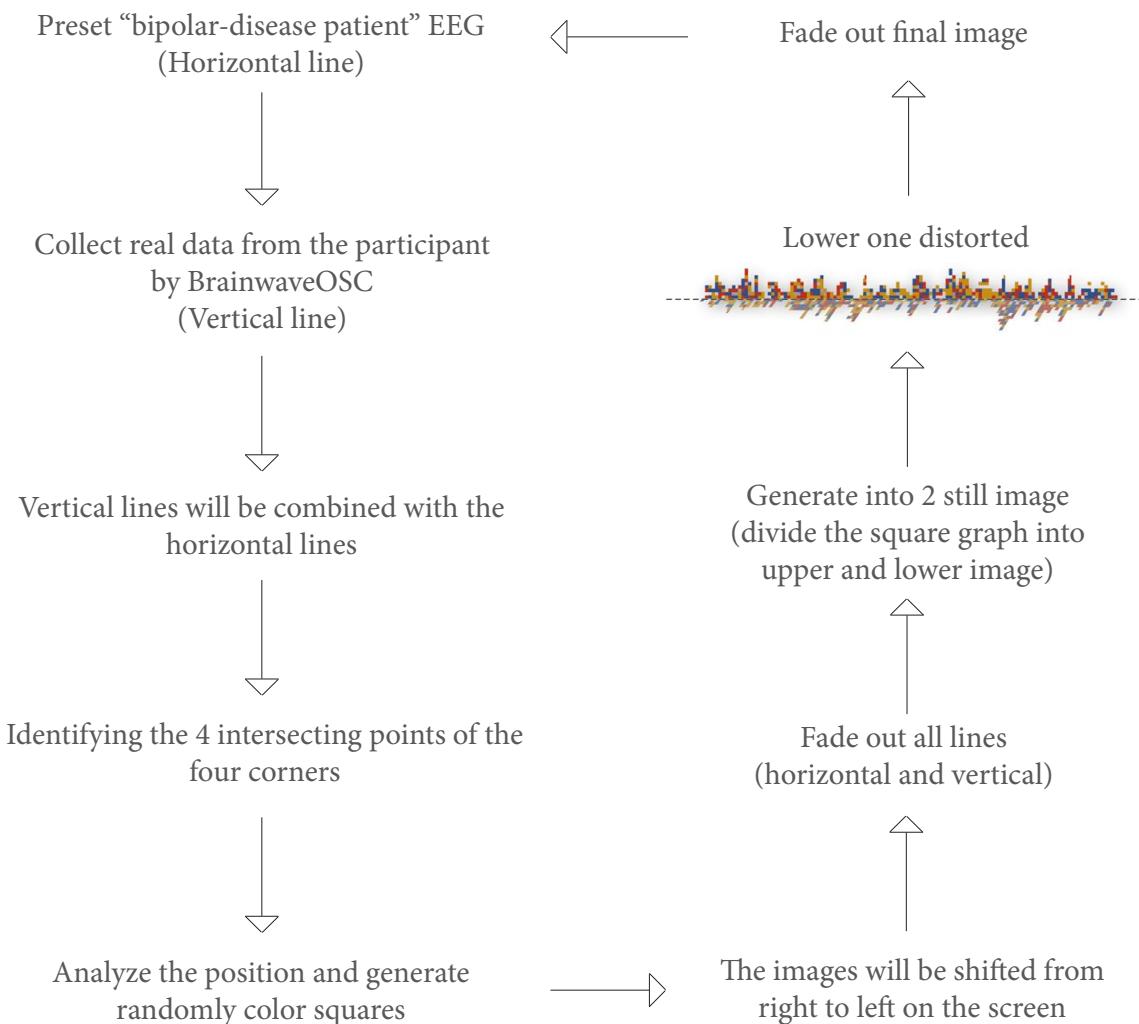
Time elapsed Signal Attention Meditation

2.00-2.98	(0.98)	53	0	0	30
3.01-4.00	(1.01)	0	0	0	31
4.05-4.97	(0.92)	0	0	0	28
5.00-5.95	(0.95)	0	0	0	29
5.98-6.96	(0.98)	0	48	94	30
7.00-7.94	(0.94)	0	38	78	29
7.98-8.93	(0.95)	0	54	50	29
8.96-9.94	(0.98)	0	64	24	30
9.98-10.95	(0.97)	0	91	29	30
10.99-11.97	(0.98)	0	100	21	29
11.97-12.95	(0.98)	0	100	35	30
12.98-13.93	(0.95)	0	100	30	29
13.96-14.94	(0.98)	0	90	29	30
14.97-15.92	(0.95)	0	60	30	29
15.96-16.94	(0.98)	0	47	30	30
16.97-17.92	(0.95)	0	61	48	29
17.95-18.91	(0.96)	80	61	48	29
18.94-19.89	(0.95)	80	61	48	29
19.92-20.90	(0.98)	80	61	48	30
20.93-21.91	(0.98)	80	61	48	30
21.94-22.86	(0.92)	200	0	0	28
22.89-23.90	(1.01)	200	0	0	31
23.94-24.89	(0.95)	200	0	0	29
24.92-25.87	(0.95)	200	0	0	29
25.90-26.89	(0.99)	200	0	0	30
26.92-27.87	(0.95)	200	0	0	29
27.90-28.85	(0.95)	53	0	0	29
28.89-29.87	(0.98)	53	0	0	30
29.90-30.89	(0.99)	0	0	0	30
30.92-31.86	(0.94)	0	0	0	29
31.90-32.85	(0.95)	0	0	0	29
32.88-33.86	(0.98)	0	75	64	30
33.90-34.85	(0.95)	0	90	70	29
34.88-35.86	(0.98)	0	74	70	30
35.90-36.85	(0.95)	0	41	69	29
36.88-37.83	(0.95)	0	20	78	29
37.86-38.85	(0.99)	0	14	66	30
38.88-39.83	(0.95)	0	16	54	29
39.86-40.84	(0.98)	0	14	53	30
40.87-41.82	(0.95)	0	26	53	29

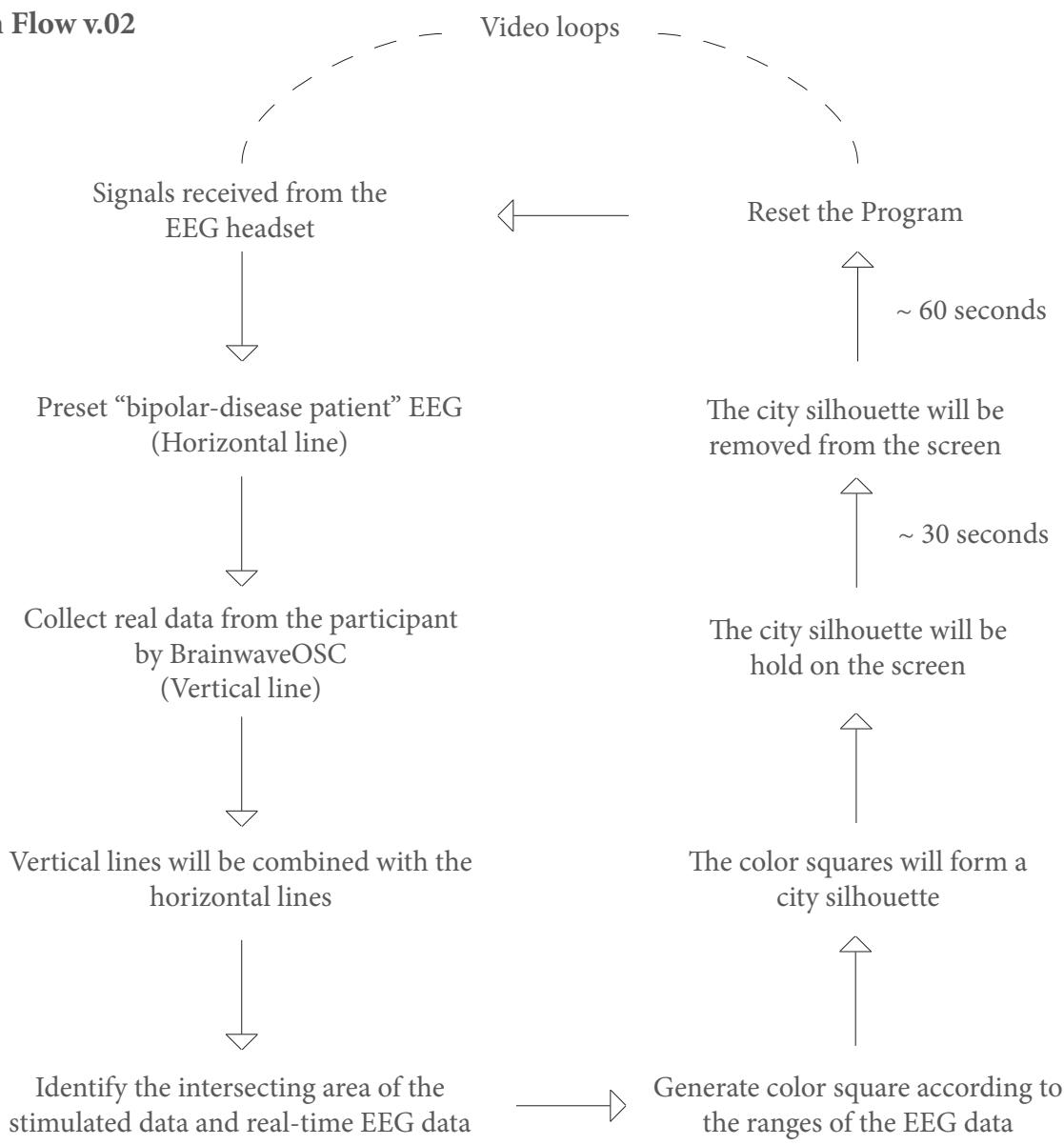
# Program Flow

With the understandings of the EEG data, we created program flow diagrams.

## Program Flow v.01



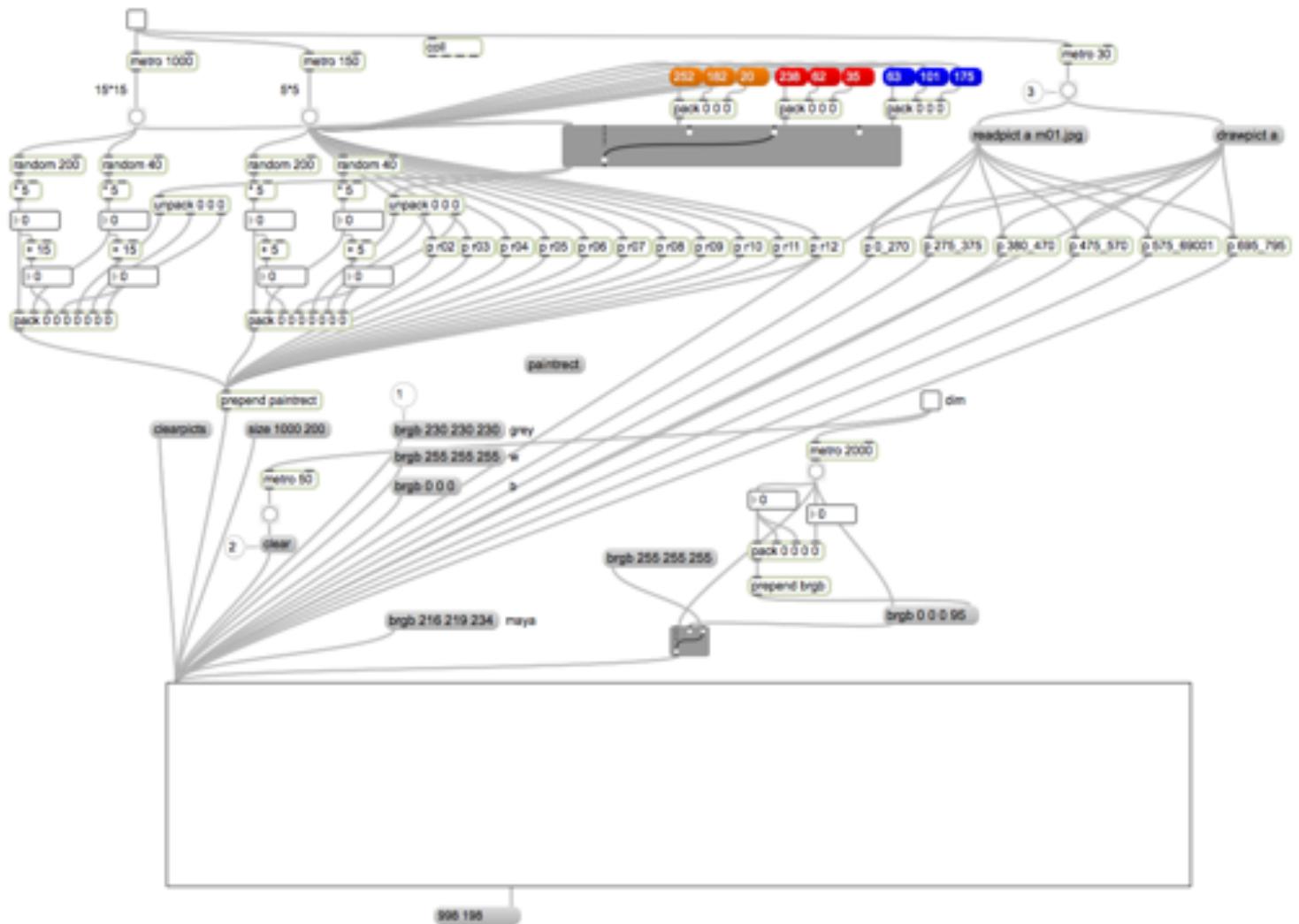
## Program Flow v.02



# Patch Development

Program v.01 - Dec 2013

In the first version of the program, the form of the city silhouette was formed according to the fixed data sets. The colors of the squares were randomly allocated with the three colors.

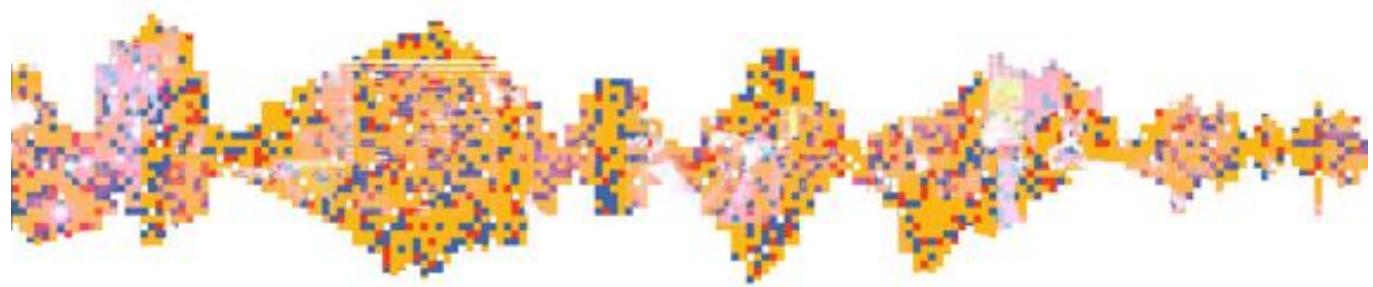
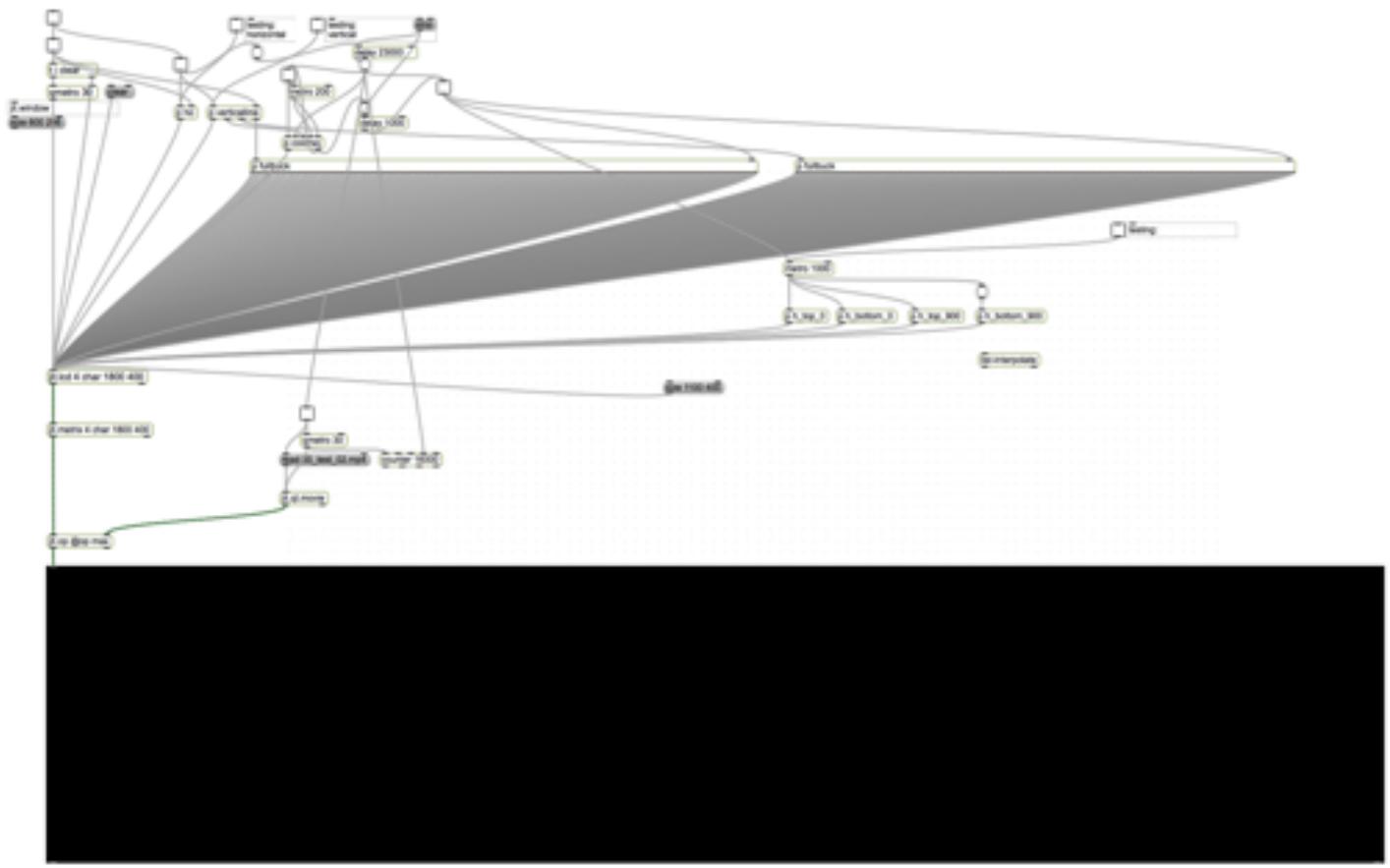


# Patch Development

Program v.02 - Feb 2014

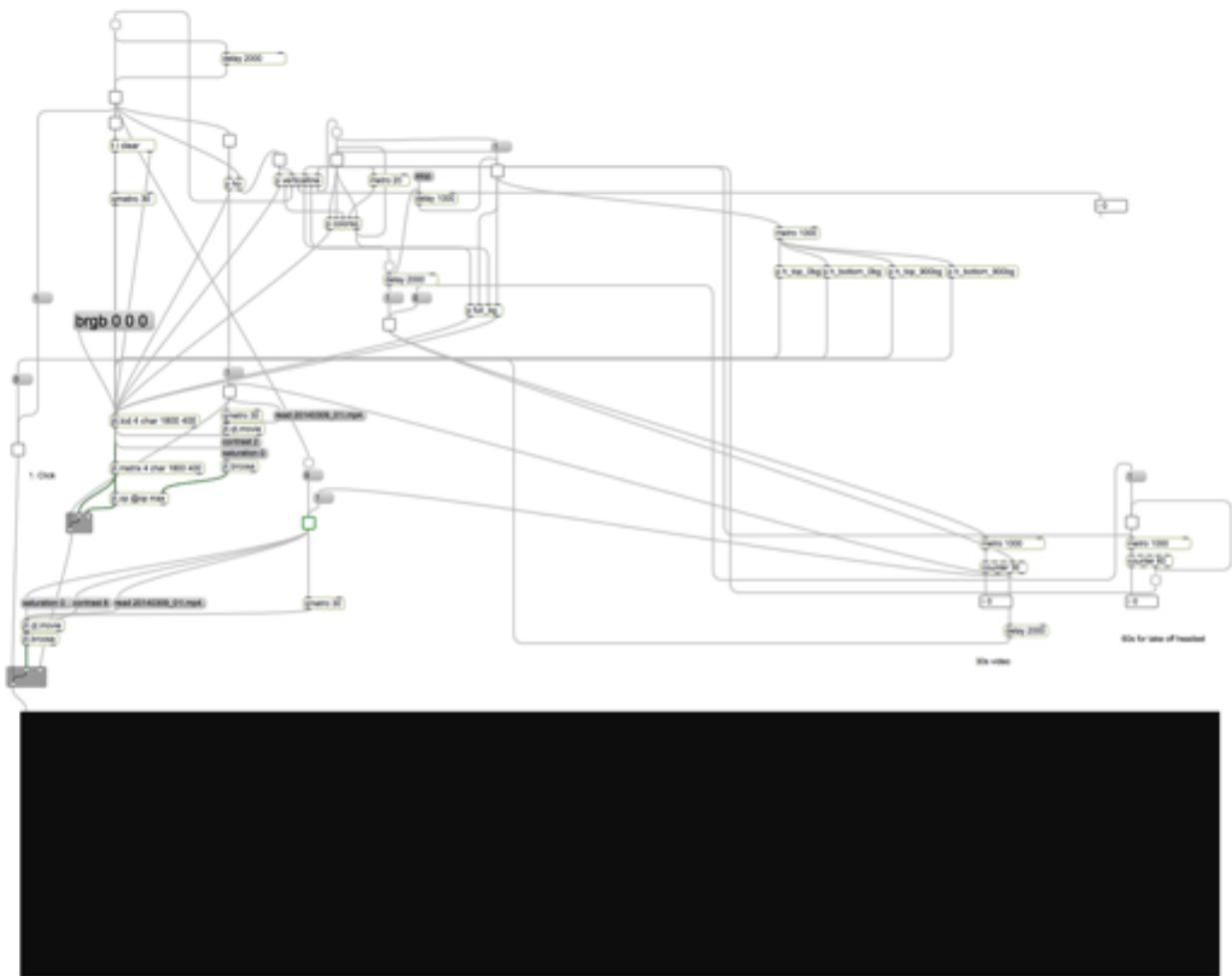
In the second version, a video which consists of footages of Hong Kong news was added to show in the color squares.

The colors of the squares were controlled by the ranges of the EEG data.



# Final Program

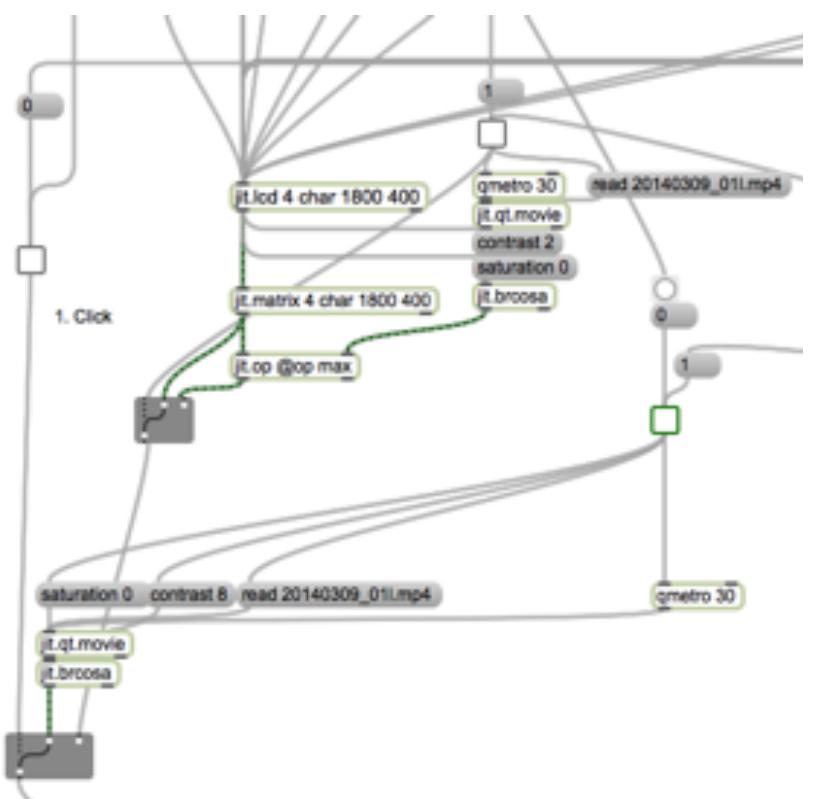
The program consists of different parts: playing the video, collecting the data, creating lines, forming the intersecting area, and generating color squares.



# Background

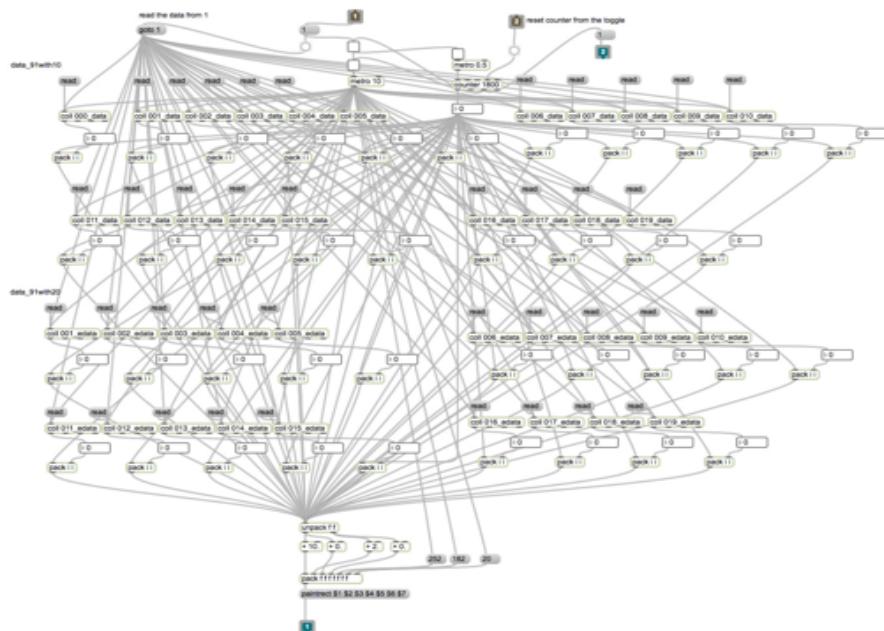
The video of Hong Kong news clip is pixelated and is in black and white.

An Object “jit.brcosa” was used to change the saturation and contrast, and “jit.op@op max” was used to create a multiply effect for the layers of video and the generative part.



# Lines

Horizontal lines shown in yellow is the stimulated EEG data of urban diseases' patients. Sets of data were put in text files, and an object "coll" was used to store the values.

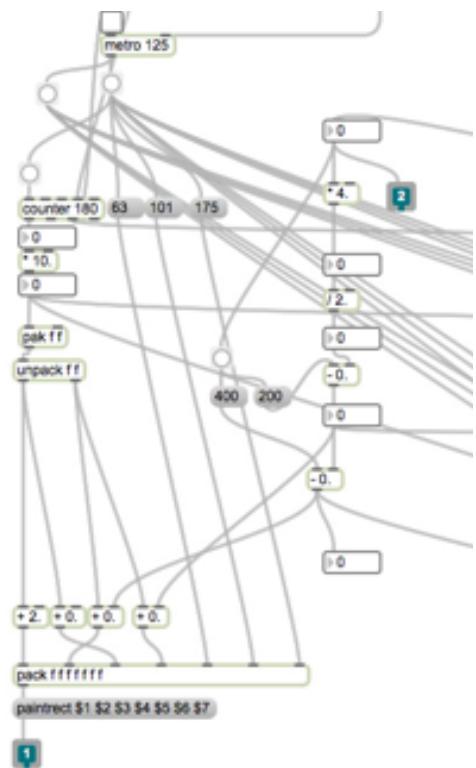




## Lines

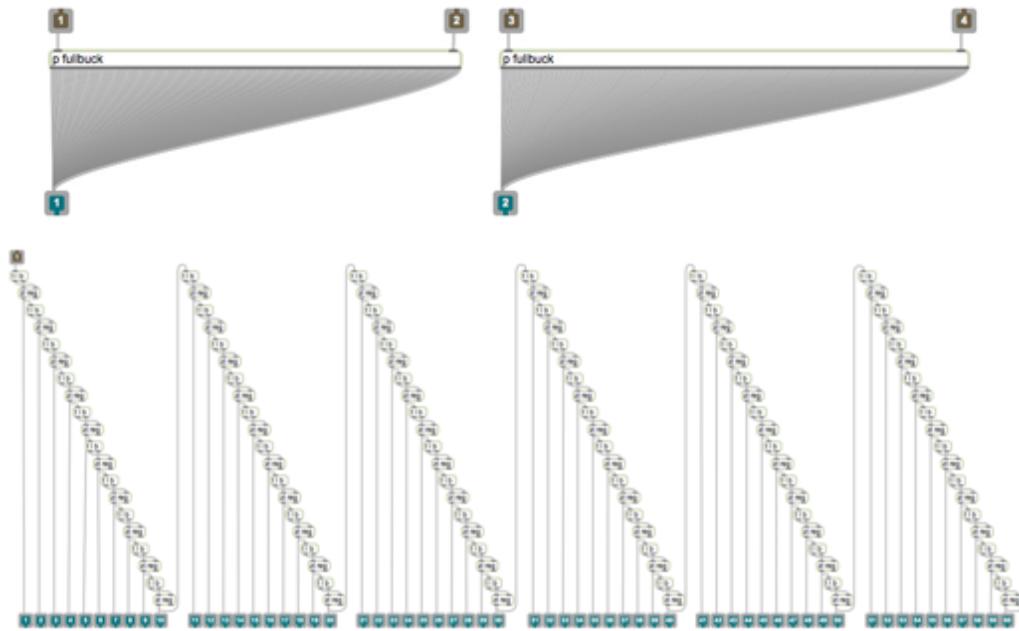
Vertical lines shown in blue is the real-time EEG data collected from the participant.

The real-time EEG data is collected; the data of attention is used to create the blue vertical lines.



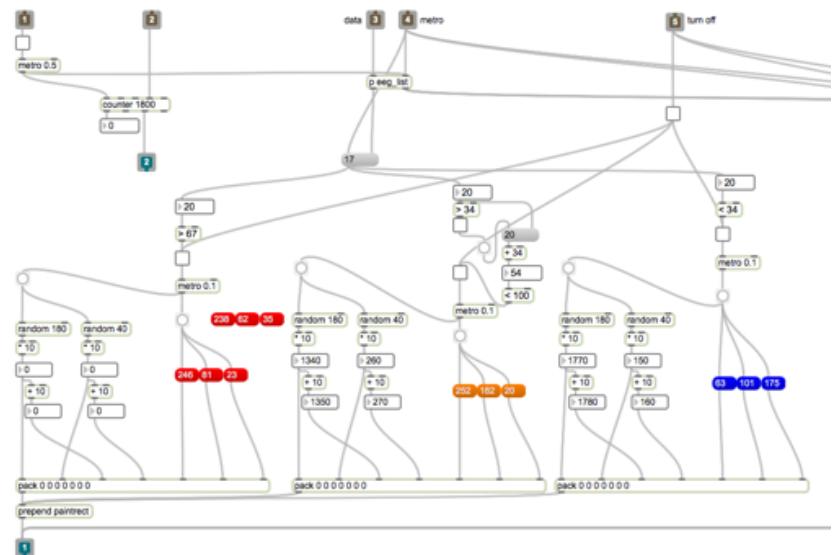
# Intersecting Area

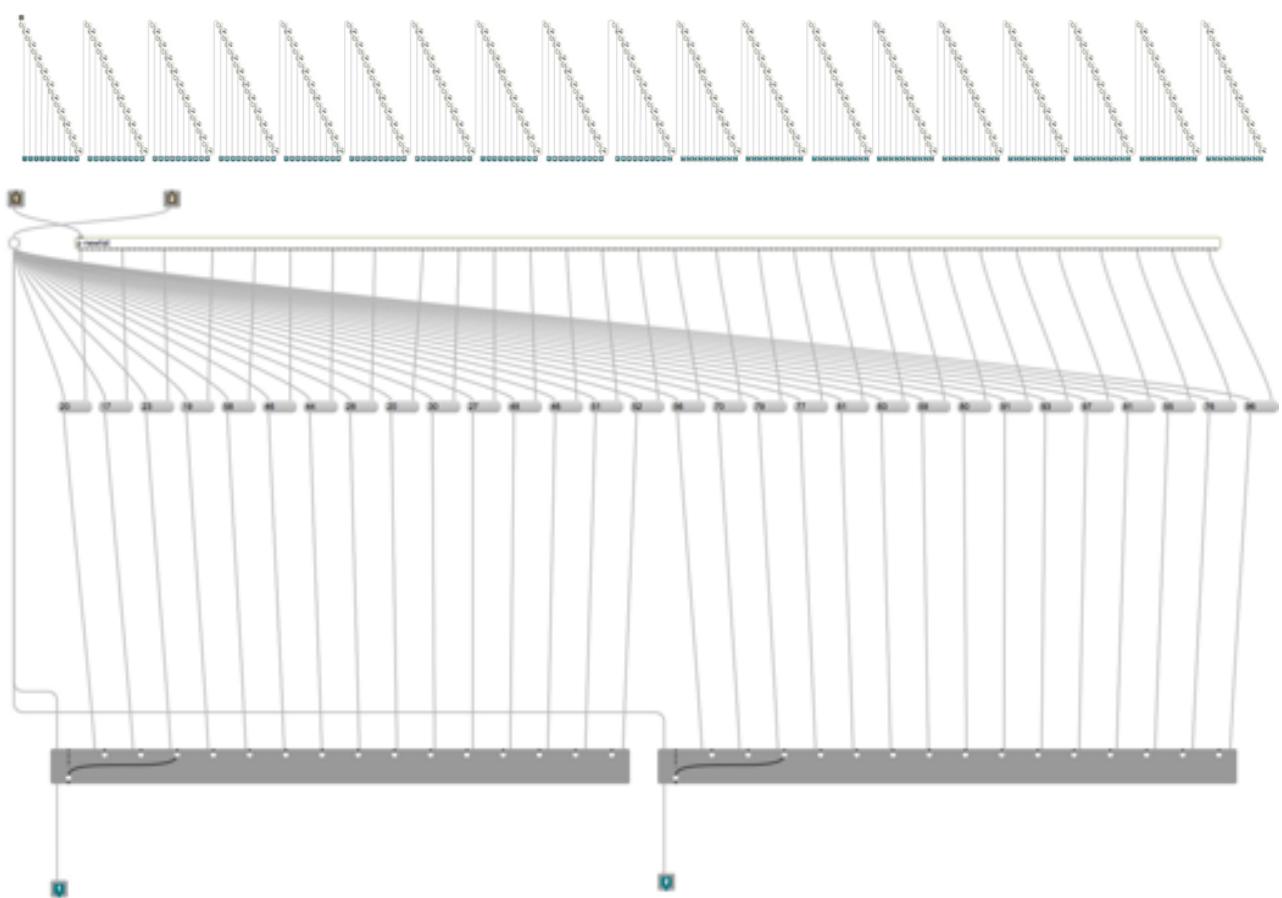
Simulated data of the urban diseases' patients and the real-time data of the participant were analyzed to result in the intersecting area. Sets of real-time data were stored with the use of lists.



# Colored Squares

The colors of the squares are in orange-red, orange and blue according to high (67-100), middle (35-66) and low (0-34) ranges of the attention data in the participant's brainwave.





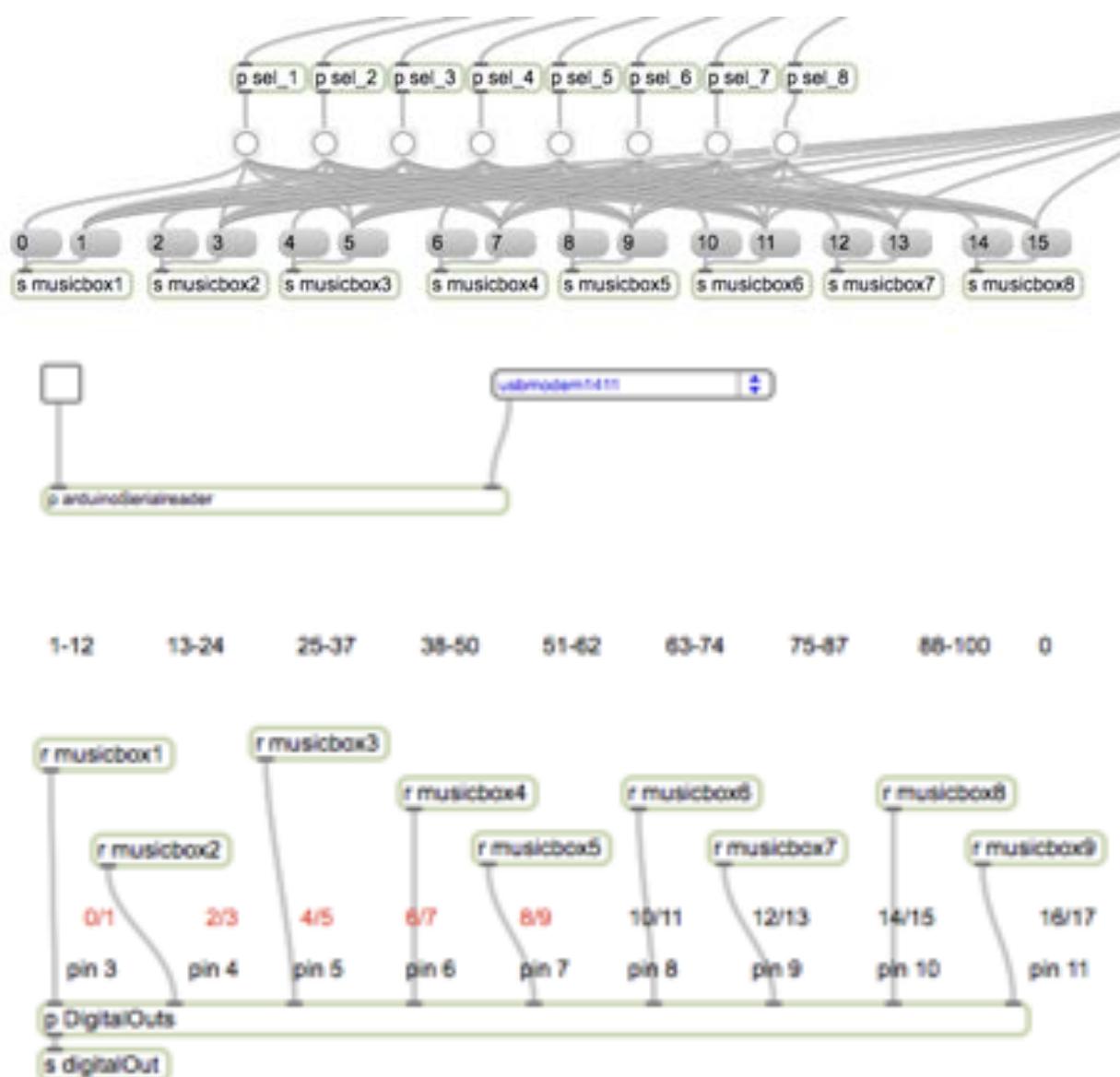
# Max to Arduino

In order to control the music boxes according to the ranges of EEG data, another Max patch and Arduino code were used to transfer the data from the main patch.

The screenshot shows the Arduino IDE interface with a sketch titled '\_20140217\_arduino\_update\_f01'. The code is a series of nested if statements that map serial values to digital pin states:

```
_20140217_arduino_update_f01
  if(serialvalue == 1){
    digitalWrite(3, LOW);
  }
  else if(serialvalue == 2){
    digitalWrite(4, HIGH);
  }
  else if(serialvalue == 3){
    digitalWrite(4, LOW);
  }
  else if(serialvalue == 4){
    digitalWrite(5, HIGH);
  }
  else if(serialvalue == 5){
    digitalWrite(5, LOW);
  }
  else if(serialvalue == 6){
    digitalWrite(6, HIGH);
  }
  else if(serialvalue == 7){
    digitalWrite(6, LOW);
  }
  else if(serialvalue == 8){
    digitalWrite(7, HIGH);
  }
  else if(serialvalue == 9){
    digitalWrite(7, LOW);
  }
  else if(serialvalue == 10){
    digitalWrite(8, HIGH);
  }
  else if(serialvalue == 11){
    digitalWrite(8, LOW);
  }
  else if(serialvalue == 12){
    digitalWrite(9, HIGH);
  }
}
else if(serialvalue == 13){
```

At the bottom of the IDE, there is a message: "Save Canceled." and the status bar indicates "Arduino Uno on /dev/tty.usbmodem5431".



# Presentation Mode

1. Click

**brgb 0 0 0**



2. Turn on to BEGIN



3. Turn on the PROGRAM to run through

As the work would be exhibited, presentation mode was set to make the control more convenient.

0





1. Click

brgb 0 0 0



2. Turn on to BEGIN



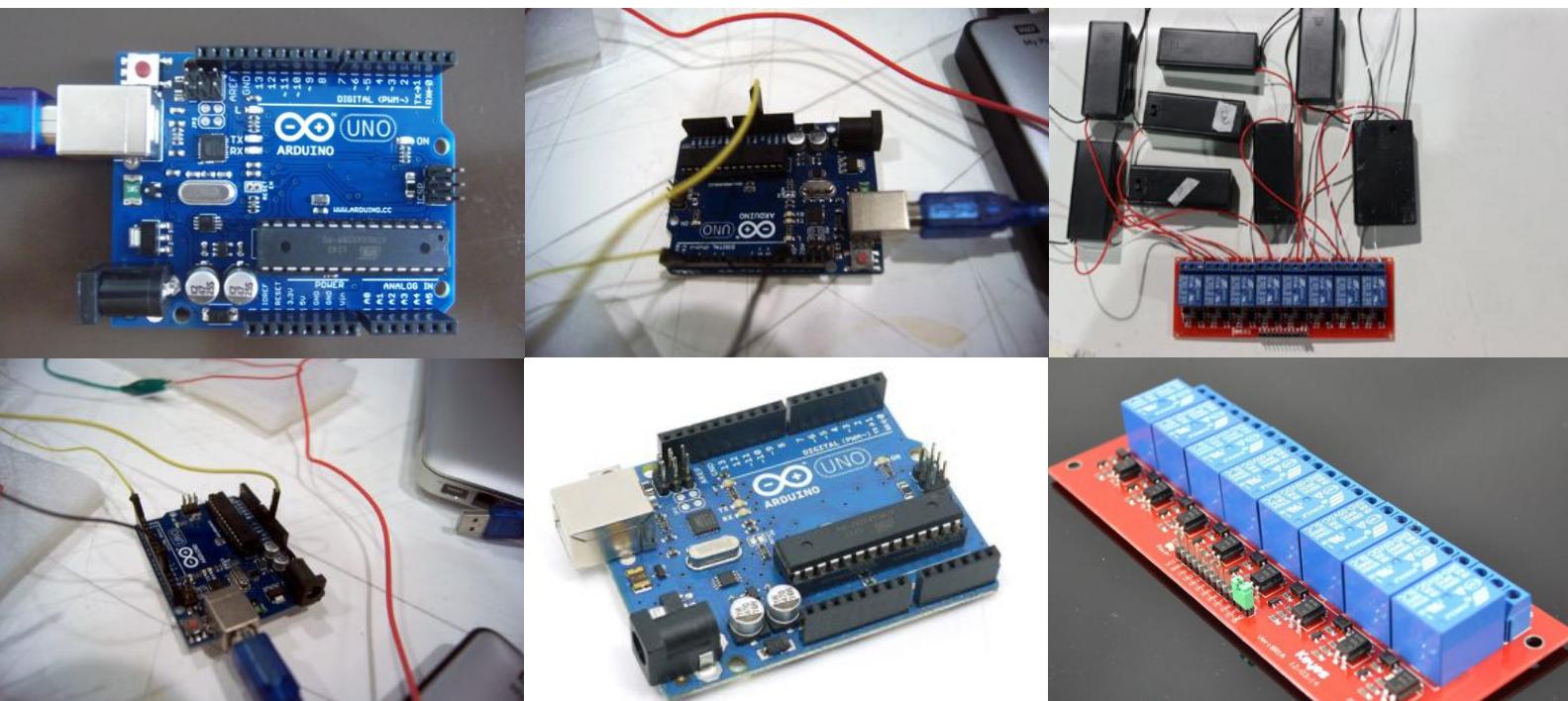
3. Turn on the PROGRAM to run through



○



Equipment

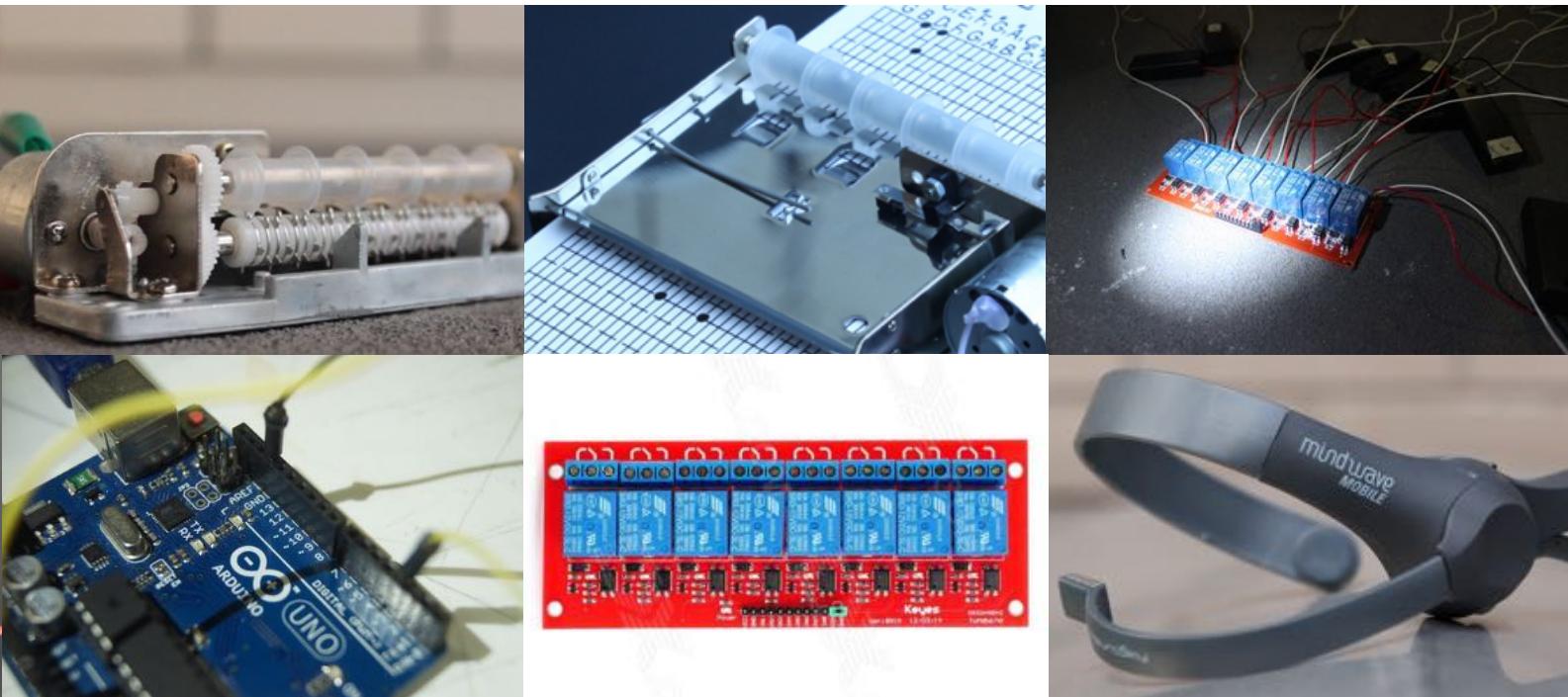


Arduino UNO

The micro-controller board was used to control the motors of the music boxes. Pin 03 to 11 were connected to the set of eight relays.

Relay

8 Relays were used as the switches for the 8 music boxes. They are connected to the battery boxes and the motors of the music boxes.



### Other Hardwares...

- Neurosky Brainwave Mobile EEG Headset
- Projector
- Screen
- iMac
- Music Boxes

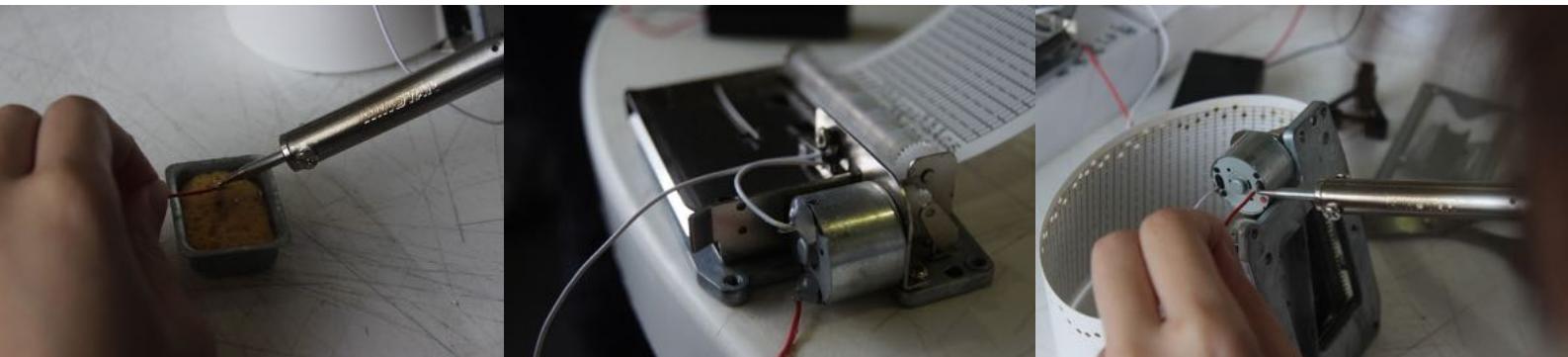


# Production Process

# Music Box

We bought the automatic music box online and had to solder the suitable length of wire onto it in order to suit our setting.

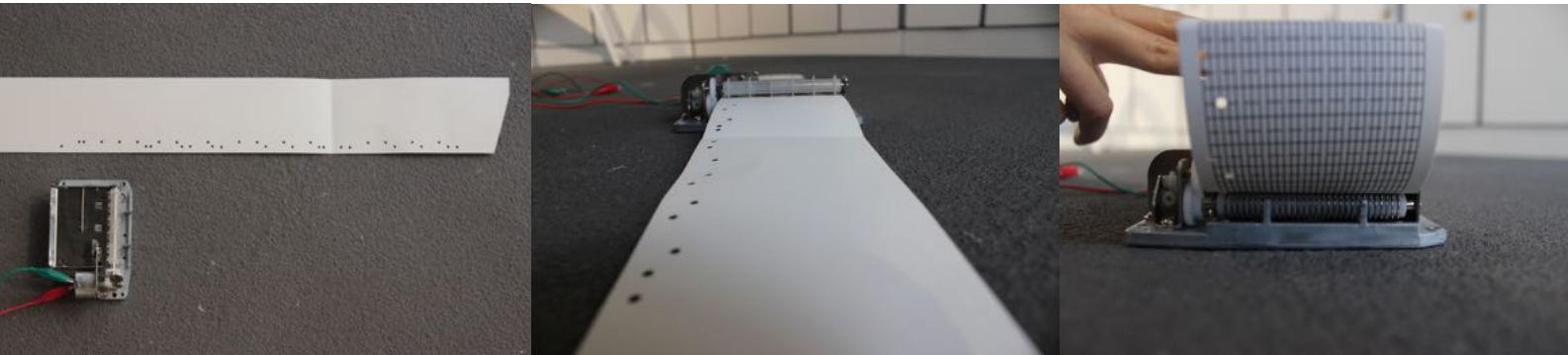
12 music boxes were bought in total, but not all of them are functional. About 2 music boxes' motors were not working smoothly or working slower than the others. Therefore, We had to fix them ourselves. For example, placing a small piece of paper stabled the motor's position.



# Music Note Sheet

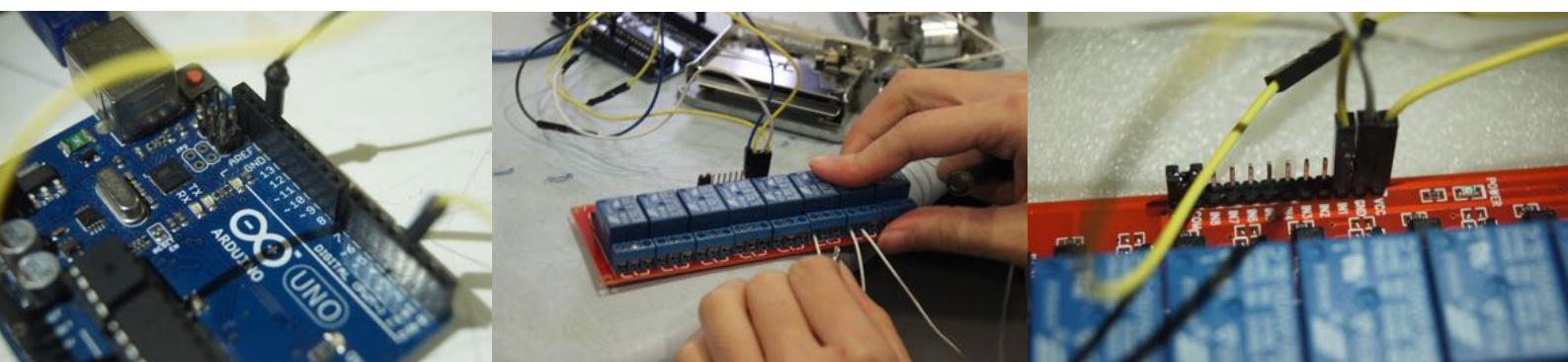
The original note sheets provided with the music box are printed with a square pattern and company's name. Since they are not suitable for exhibition use, we decided to replace it with our own paper. We tested yukou paper, drawing paper and white card paper, but they are either too thick to pass through the music box or too thin to create a circle for looping. In the end, we chosen photo paper card, which shares a similar texture with the original note sheets, and print them with the colours we want for our artwork.

Other than paper texture, we also faced difficulty in the connecting materials to create a note sheet circle for looping in the music box. The connecting point cannot be too thick or it will be stuck at the entry of the music box and cannot loop by itself. We tested masking tape, wire harness tape, sewing and hot bond. And finally we found normal scotch tape will be the best material as it is thin enough.



# Relay

We used the relay to control the on and off of music box with arduino. And we bought a 8-source relay so that it can link up all 8 music boxes at the same time. However, source no.7 always had the problem of losing control after a long duration of usage. At first, we considered that it is the technical problem of relay, so we bought a new one to replace it. However, after we replaced it for the third time, we tested it with other music box and realised that it may be no.7 music box's own problem which may cause the damage of no. 7 relay. We learned that we should have tested more thoroughly for finding out the fundamental problem.



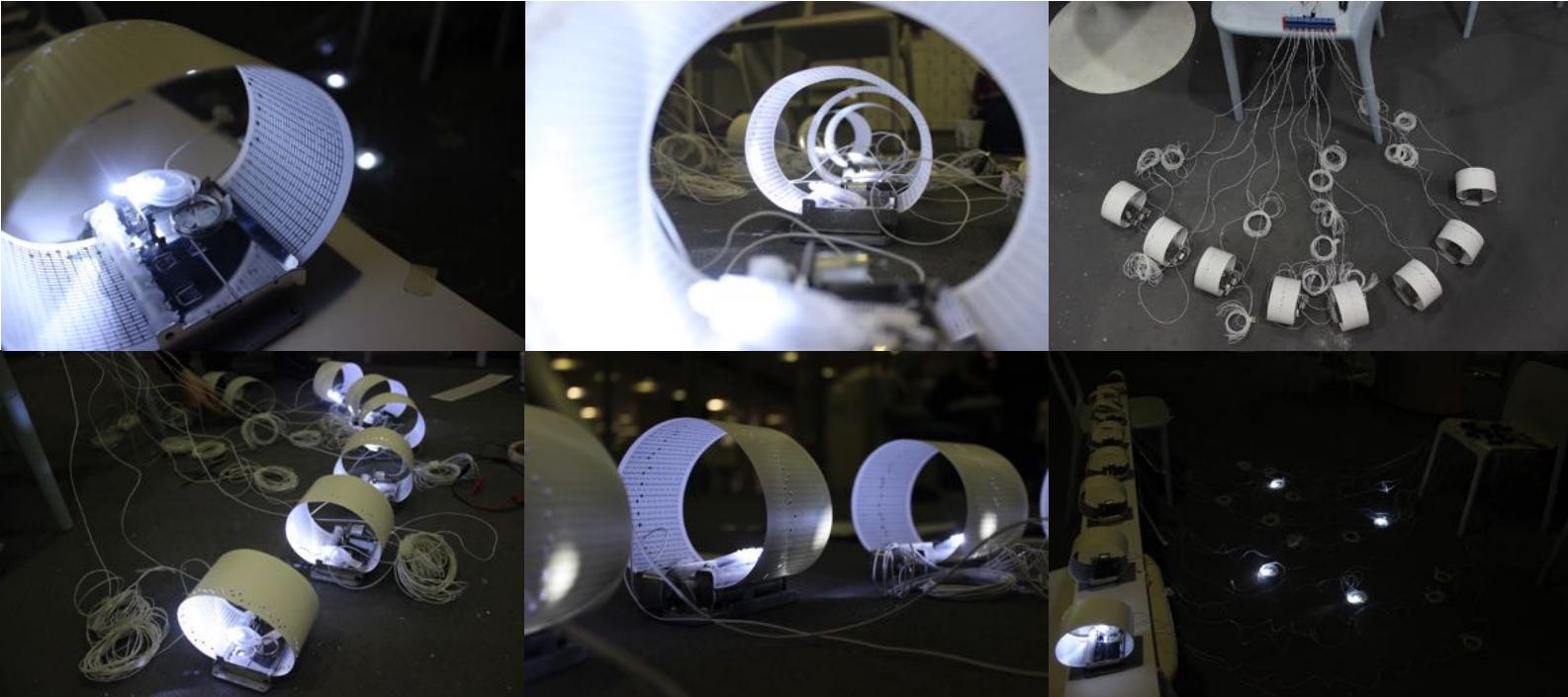
# Arrangement of Setting

Since we decided to use a long wood block for putting the music boxes, we had to prepare the setting of the music boxes on the wood block before they were fixed on the wood. We had to calculate the average distance between the music boxes, and another music box was fixed on a short wood block separately. Eventually, adjusting the distance between the music boxes took longer than expected because we aimed to achieve an accurate spacing for setting.



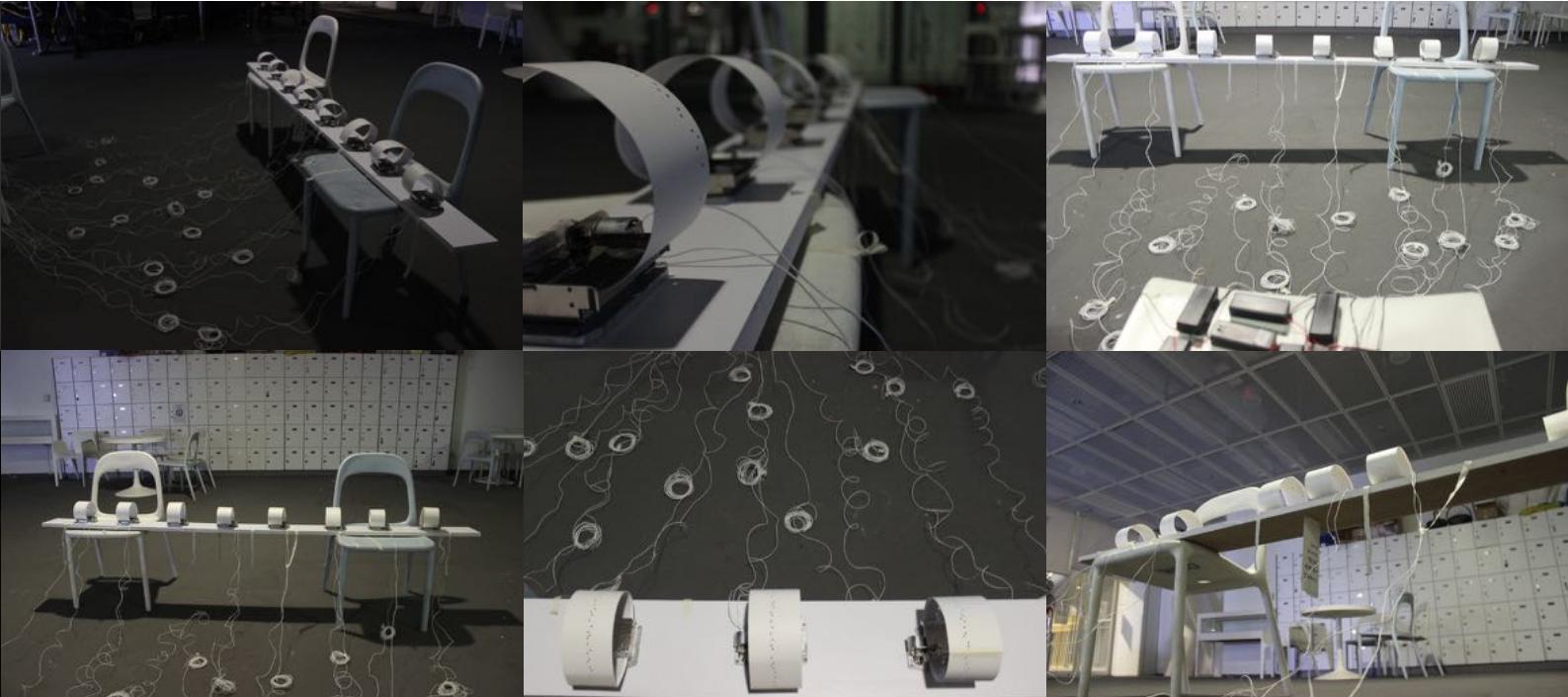
# Lighting and Wire

Lights will be used for creating the shadow of the holes. In order to accomplish a better lighting, we have tested to put the lights on different positions of the music box. Moreover, adjusting the angle of the light was also an important issue as it significantly affects the sharpness of the shadow.



As long wires were used for connecting the music boxes to the Arduino, we had to manage how the wires will be presented in the exhibition. For example, we have made the wires into brunches. However, we finally decided to use the simplest presentation of wires since we would like the audience to have a focus on the projection and the music boxes rather than the wires.

Moving the whole setting was also a difficult task as the junction of wires were quite fragile, so we learnt to use a large bag to package the wires well and prepare time for putting the wires back into order when we arrived the exhibition venue.



# Wood Block

After we have bought the long wood block, we had to polish it due to its uneven surface. First, clay was used to smoothen the wood surface, then white acrylic color was painted on the wood block. In this process, we need to be very careful on even a small pitted area because it may adversely affect the transmission of sound.

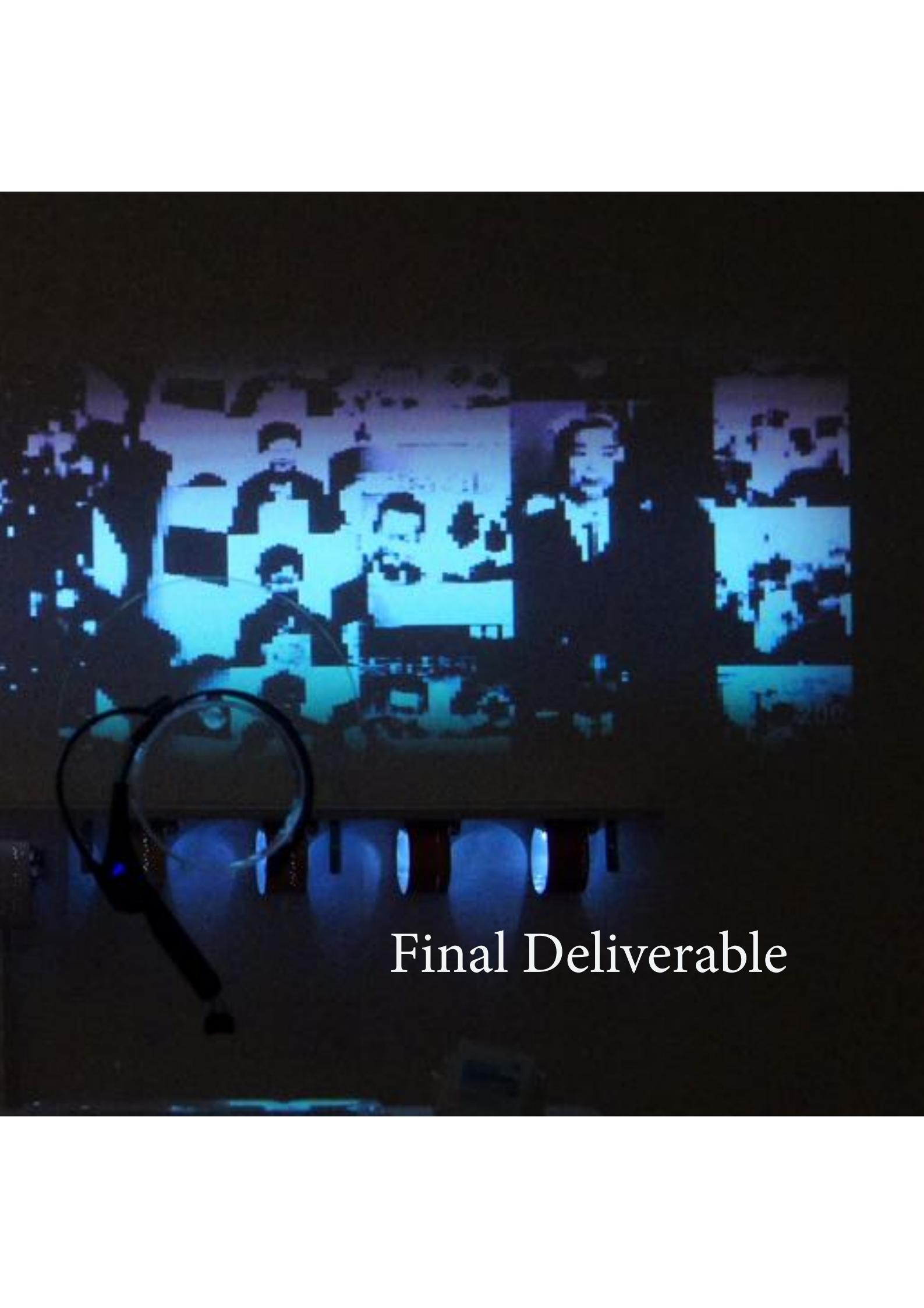


# Projection

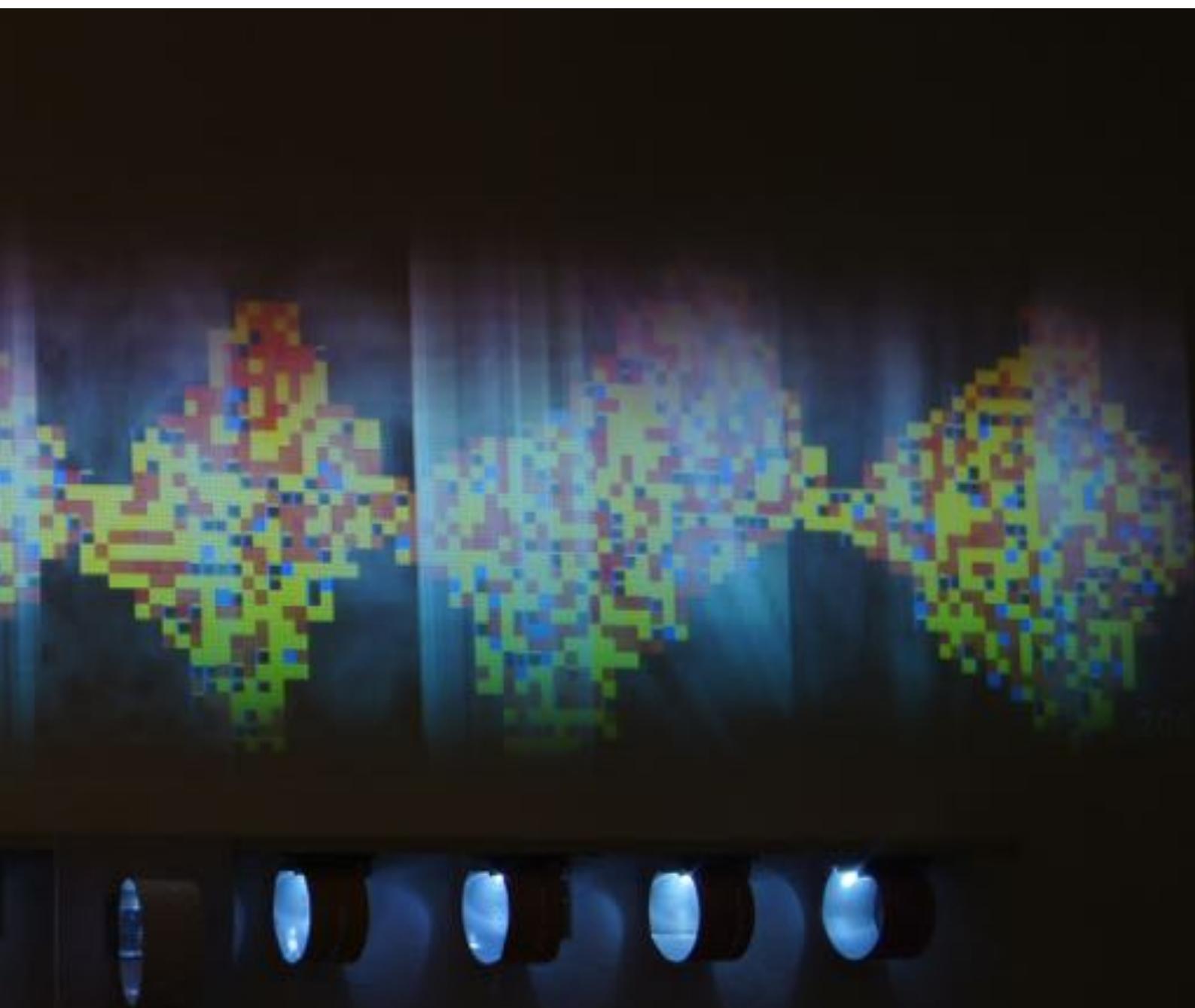
According to our final setting, the length and width of projection are 1800 pixels and 400 pixels respectively. Therefore, the lens of the projector needed to be covered partially. Before we asked our tutor's opinion, we thought that we would have to use some special materials to block the lights. We finally use normal paper for as the cover. However, using the paper for covering the lens will result in a blurred edges, so we adjusted the size and made a customized lens cover for the projection.

Although the size of the cover for testing was accurate, the appearance was not neat enough to be put in the exhibition. Additionally, the distance and angle of the projection will affect the area covering for projection. Through this experience, we learnt that we have to spend extra time on making a new cover for different set up in exhibition venues.



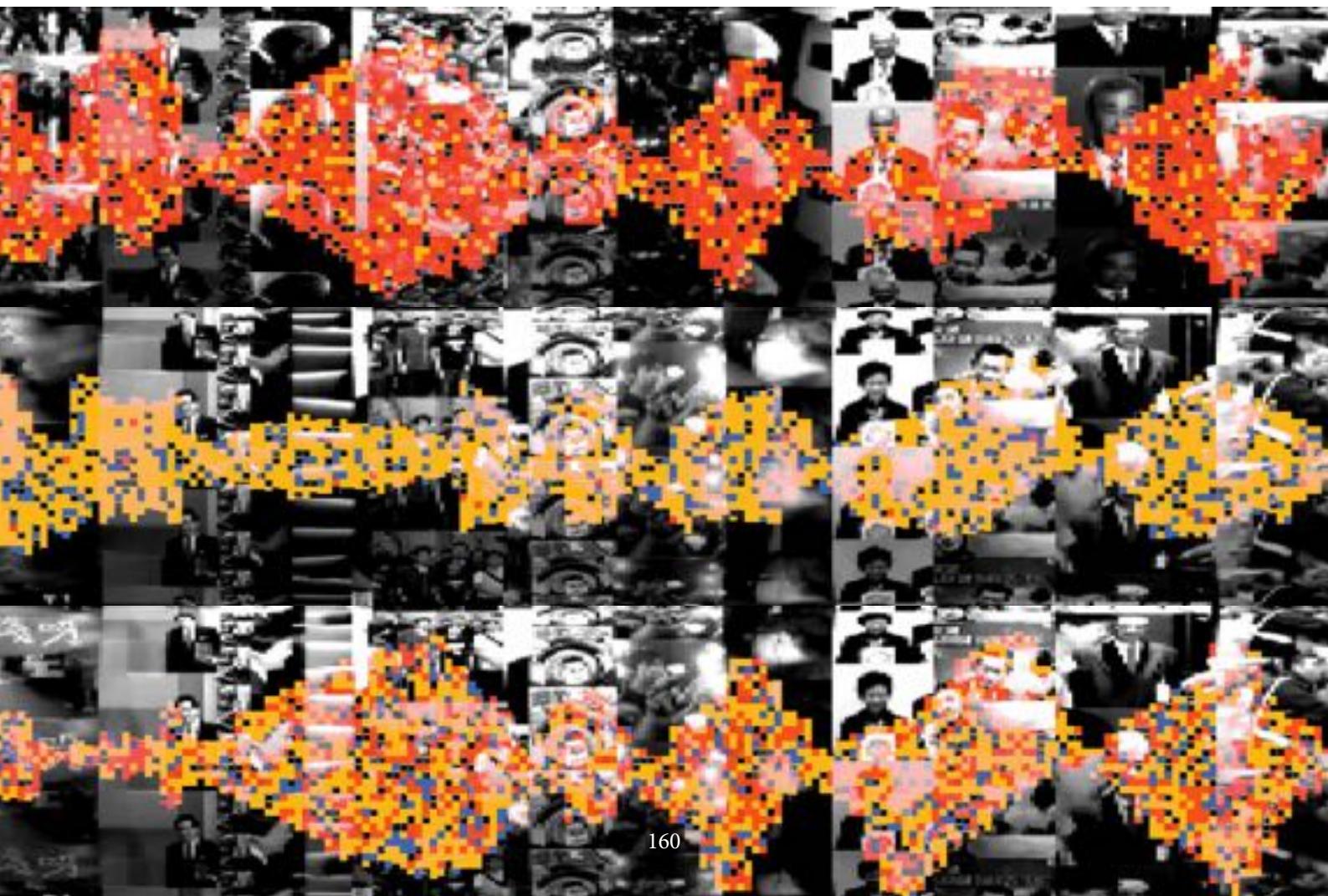


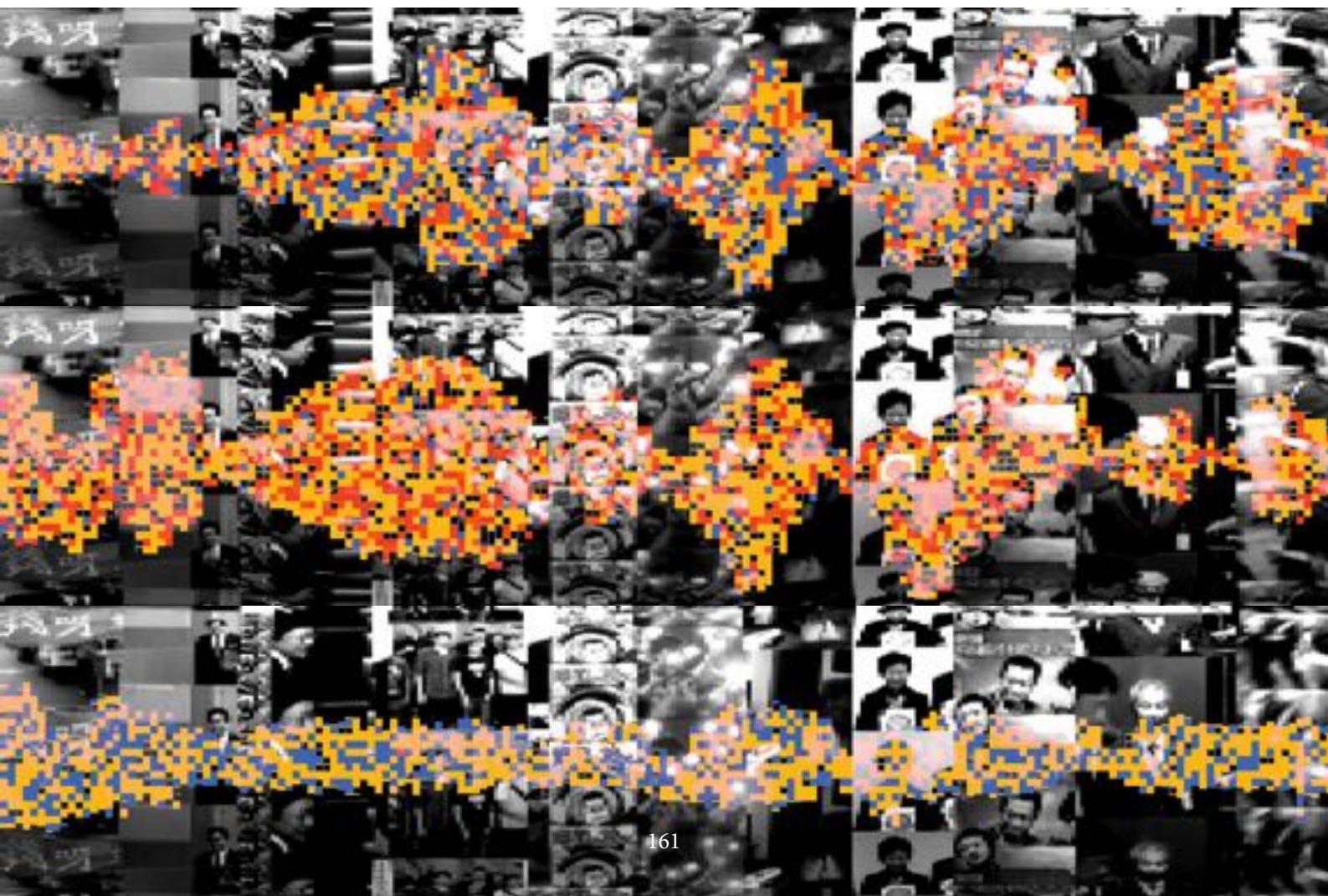
Final Deliverable



# Result of Data visualization

We invited people to experience the work, and possibility of patterns was discovered and printed as a collection of data.





# Publicity

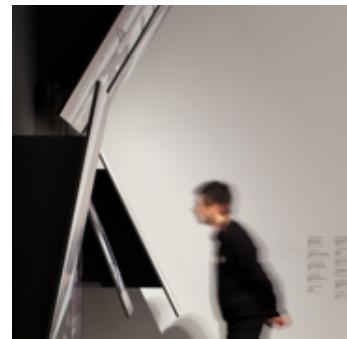
Promote our project and installation to the public

- City Impression Exhibition @ City Gallery
- The 19th ifva Awards
- Chai Wan Mei: Art & Design Festival

# Visual References on Exhibition Setting

References for the design on set up

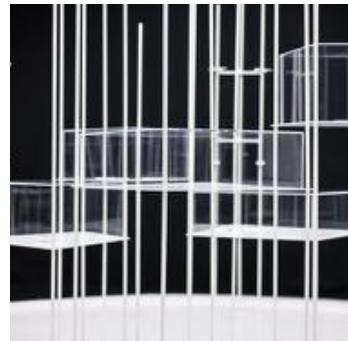
- Put on the wall
- More traditional
- Diversity can be made through using boxes



- Utilize a large space
- Spatial experience



- Hang on stands
- Spatial experience
- Connection and separation of spaces



- Create a space to put the information inside
- May lead audience to read the information



- Use the ground
- A variety of forms



四樓 4/F

Pre-visualization

# Pre-visualization Ver.1

The EEG of urban disease patients will be automatically played out on the screen. The wireless brainwave headset will be set on the table with a tablet showing the instructions. The participant has to put the sensor on, and the forehead tip and ear clip should be set in place properly.

The headset will capture her EEG data and show it on the screen. The data will be combined with that of urban disease patients.

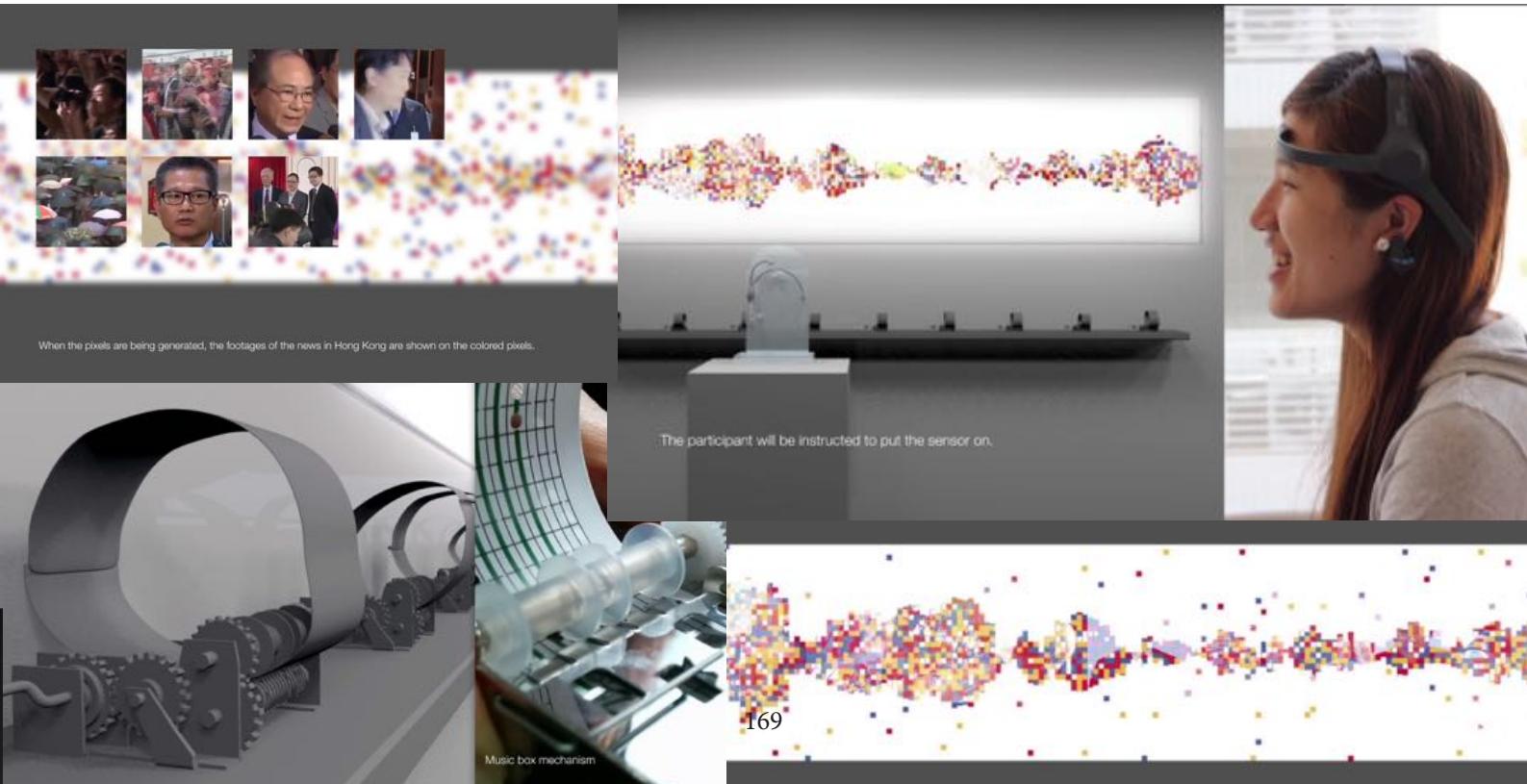
YouTube: [http://youtu.be/\\_w7toOp3zbo](http://youtu.be/_w7toOp3zbo)



# Pre-visualization Ver.2

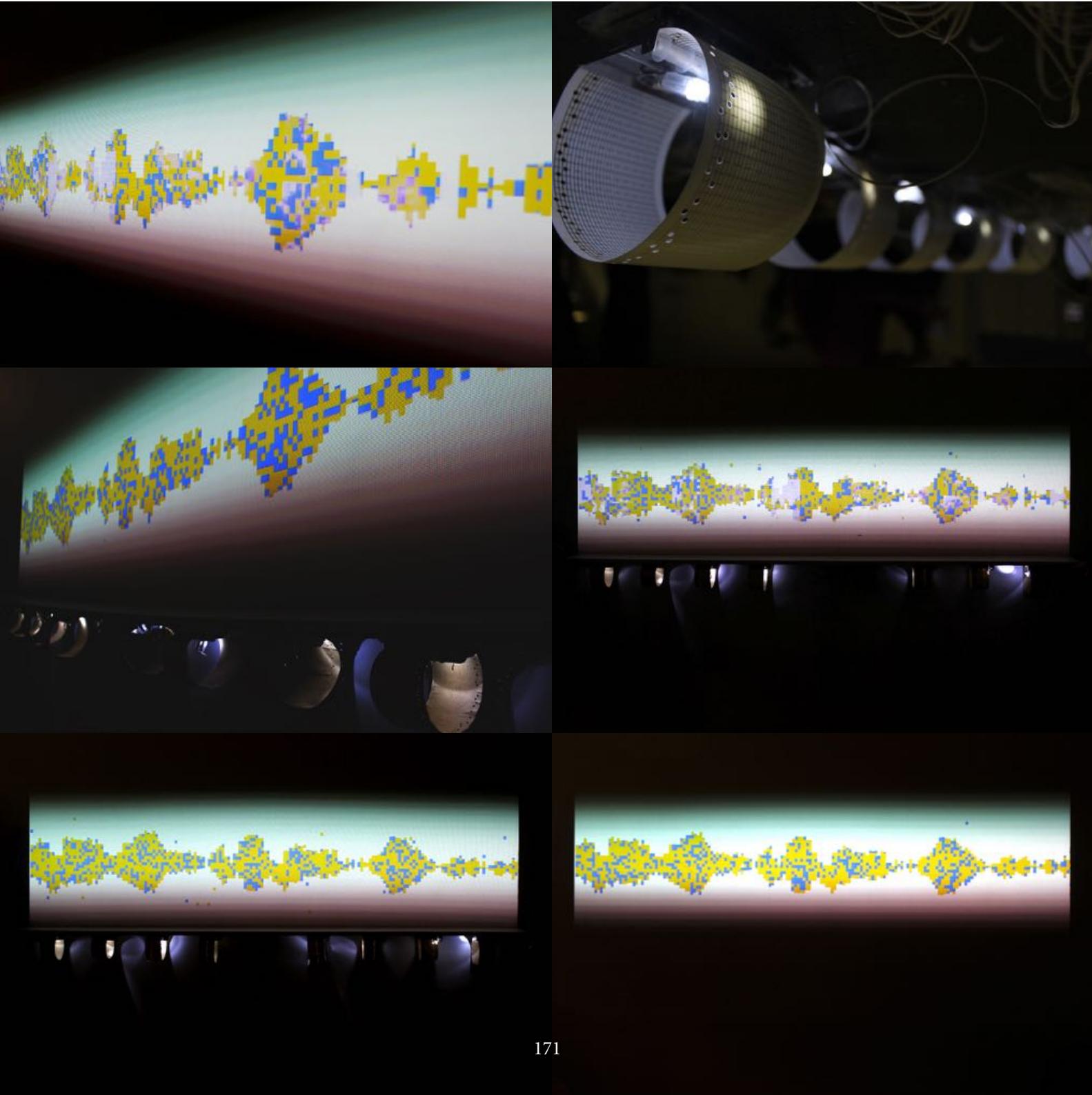
The wireless brainwave sensor will be put on the table. The panoramic screen was replaced by a normal flat screen. Below the projection, nine music boxes will be fixed on a wood block; eight music boxes will be played according to the ranges of data while the centered music box will play the main melody.

YouTube: [http://youtu.be/yX3AWZc65\\_E](http://youtu.be/yX3AWZc65_E)



# Setting Rehearsal

As a preparation for the exhibition, a setting rehearsal was held in the school library. We played through the steps, and we revealed the possible problems that may occur during the interaction. Through the rehearsal, we have adjusted the projection, the light of the music box and the place of the woodblock.



# Problems

## Problem1 : Panoramic Screen

Panoramic screen required a large space and resource like partition board and stand etc. to build up. However, in the 19th ifva awards, we are not able to have such a large area and equipments for us to build it up.

## Solution : Single-screen Projection

We change it into a single projection onto flat-surface of wall to replace such complicated panoramic setup. However, we cover the topper and lower side of the lens to narrow the projection and create the long rectangle shape that we want. Besides, we use darker lighting to create the isolated feeling.

## Problem2 : Wire Management / Allocation

Each music box will need to connect with 2 long wires to the relay. These, then, create a lot of wires linking out from the wood board, which are planned to be installed onto the wall. Therefore, we have to plan out how to hide and allocate the wires well.

## Solution : Centralize the Wire

All the wires from the music box will be centralized to the middle of the wood board. They will become one large brick of wire and then connect to the relay inside the cupboard. Centralizing the wire is also hoped to deliver the idea of integration, where many small wire join together and become one big unit.

# City Impression Exhibition

## 26/2-4/5 at Hong Kong City Gallery

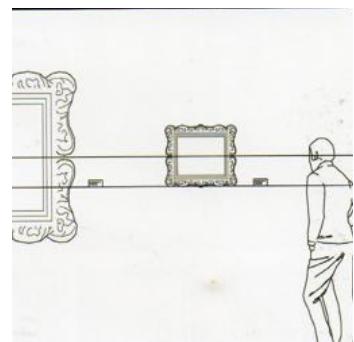
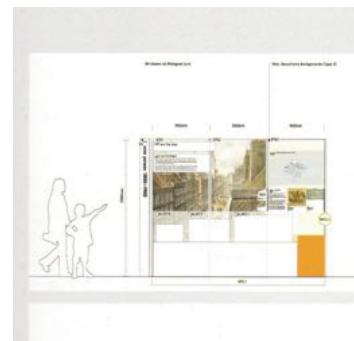
During 26 Feb - 4 May 2014, we had an exhibition at G/F, Hong Kong City Gallery. This exhibition displayed our early stage design process of the project.



# “Exhibition Design“ - Philip Hughes

reference for the design of set up

- Using single path in small exhibition space to control the direction of visitor
- Acknowledge visitors the background of our work before they go inside
- Using eye-catching visual
- Example of drawing the preview graphic
- Practical exhibition layout examples



# Key Visual

According to the book *Exhibition Design*, a key visual can make the exhibition design more eye-catching. Therefore, we created a graphic as a key visual for the exhibition.



different variation in visual



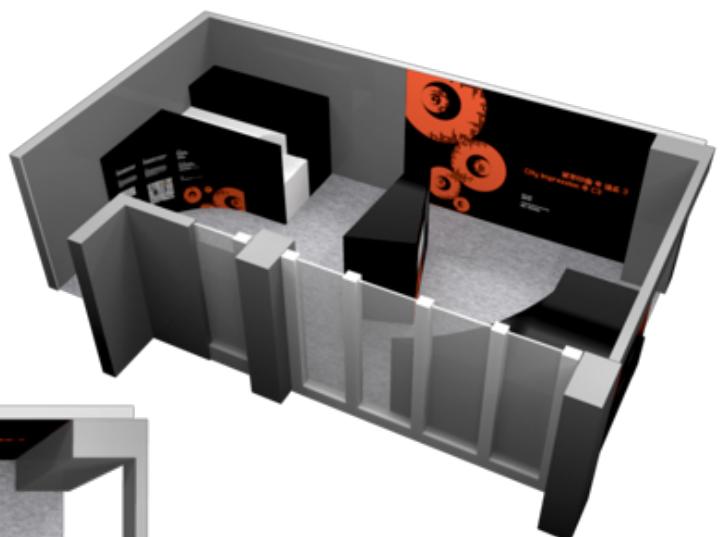
The final version of the key visual, which uses the silhouette to create the negative space

# Exhibition in different view



# Exhibition Setting

In the first stage,  
The curved boards are used to create a better  
spatial experience.



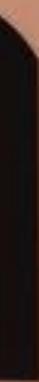
For the final version of the setting,  
the curved board was changed into flat one after  
discussion with City Gallery and addition of braille  
board.



iffva

Hong Kong Arts Centre





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# The 19th ifva Awards

We are glad to be one of the finalists in The 19th ifva Awards Interactive Media Category, which is organized by Hong Kong Arts Centre. Therefore, we had prepared to have an exhibition of our installation in Pao Galleries.

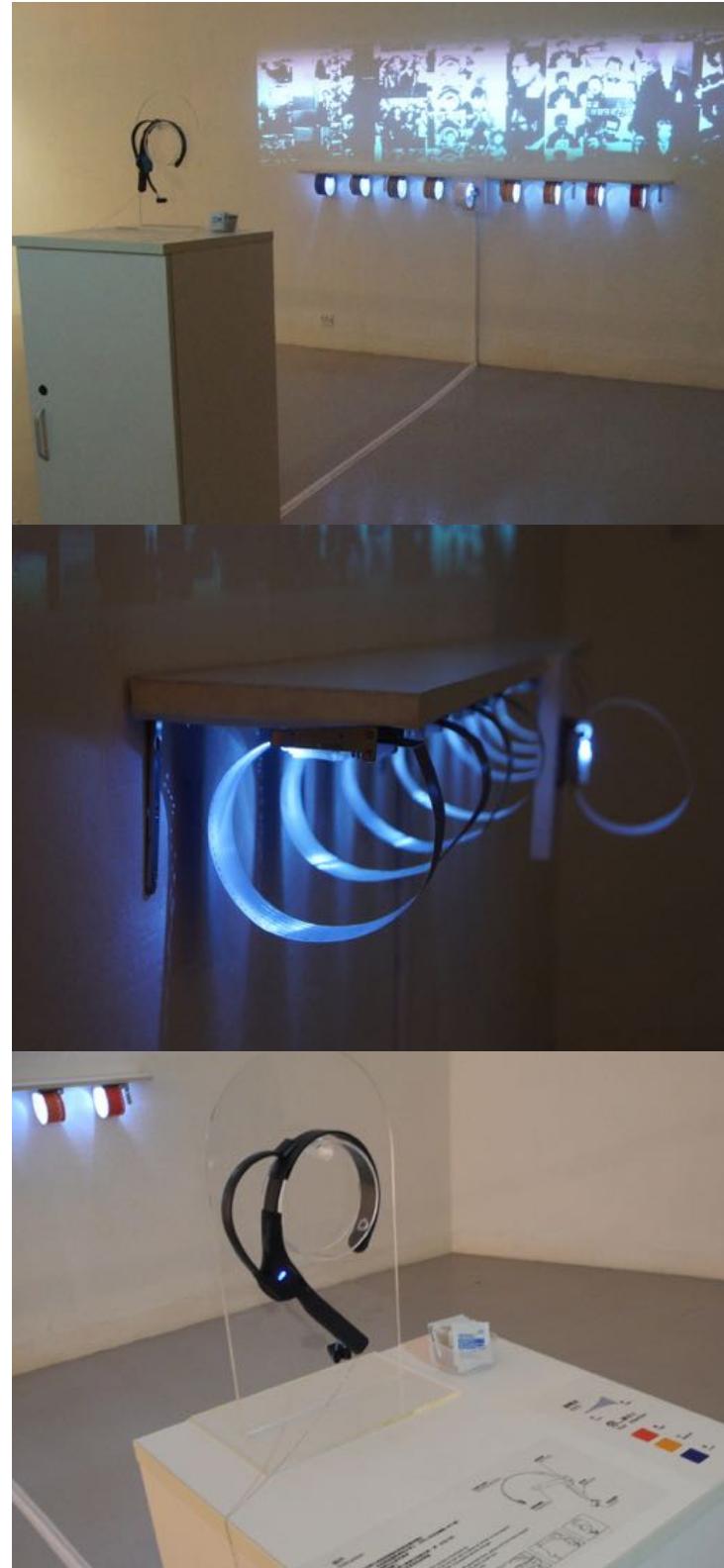


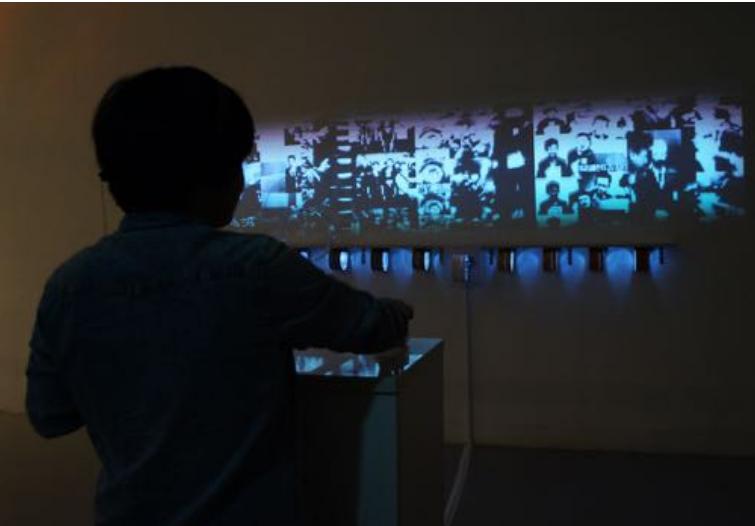
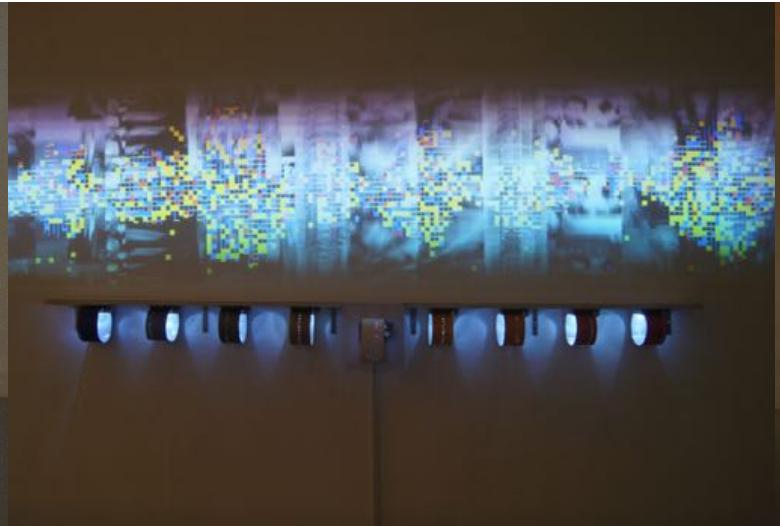
Measuring the actual size of the area that we have in the exhibition



# The 19th ifva Awards

From Mar 13-31, our installation was displayed and visited by different audiences.

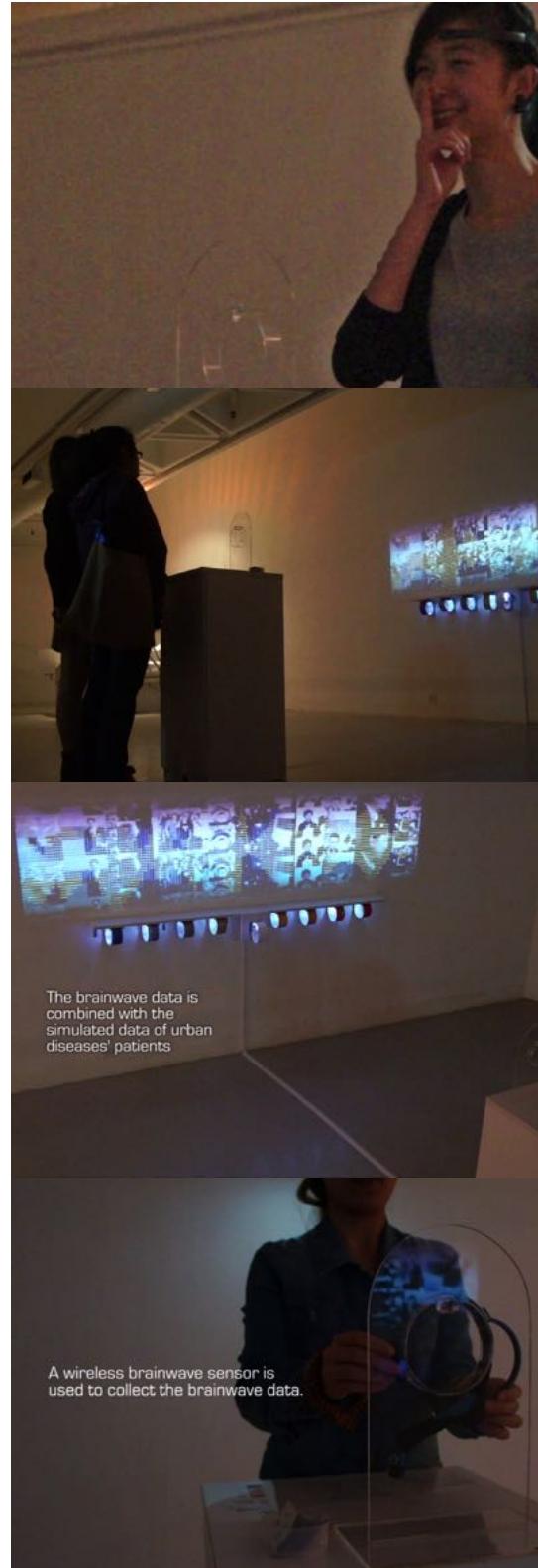


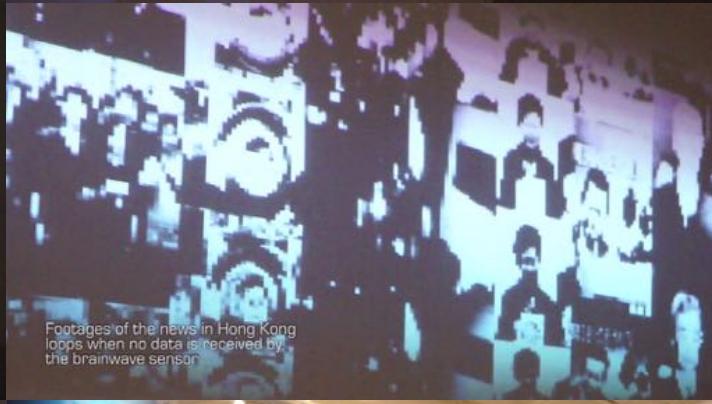


# ifva Interactive Media Category Finalist Exhibition Highlights

<http://youtu.be/w0lkGWIqYvI>

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We are honored to achieve the Silver Award of The 19th ifva Awards Interactive Media Category. It is such a valuable experience that we met people in this industry, and this recognition encouraged us to continue the exploration in this area.



ifva

# ifva awards

Interactive Media Category

互動媒體組



the 19th  
ifva Awards  
Interactive Media Category  
Silver Award

第十九屆  
ifva 銀色短片及影帶媒體比賽  
互動媒體組別

—  
**Integrated Branching City**  
融和、衍生與城市

—  
Fung Wing-lam, Ngai Po-yiu, Kwok Wan-ting,  
Choi Ka-man  
高祖林、段寶琪、郭祖玲、蔡嘉文

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# CHAI 柴 WAN 蔭 MEI 尾

16/17  
MAY  
2014  
HONG  
KONG

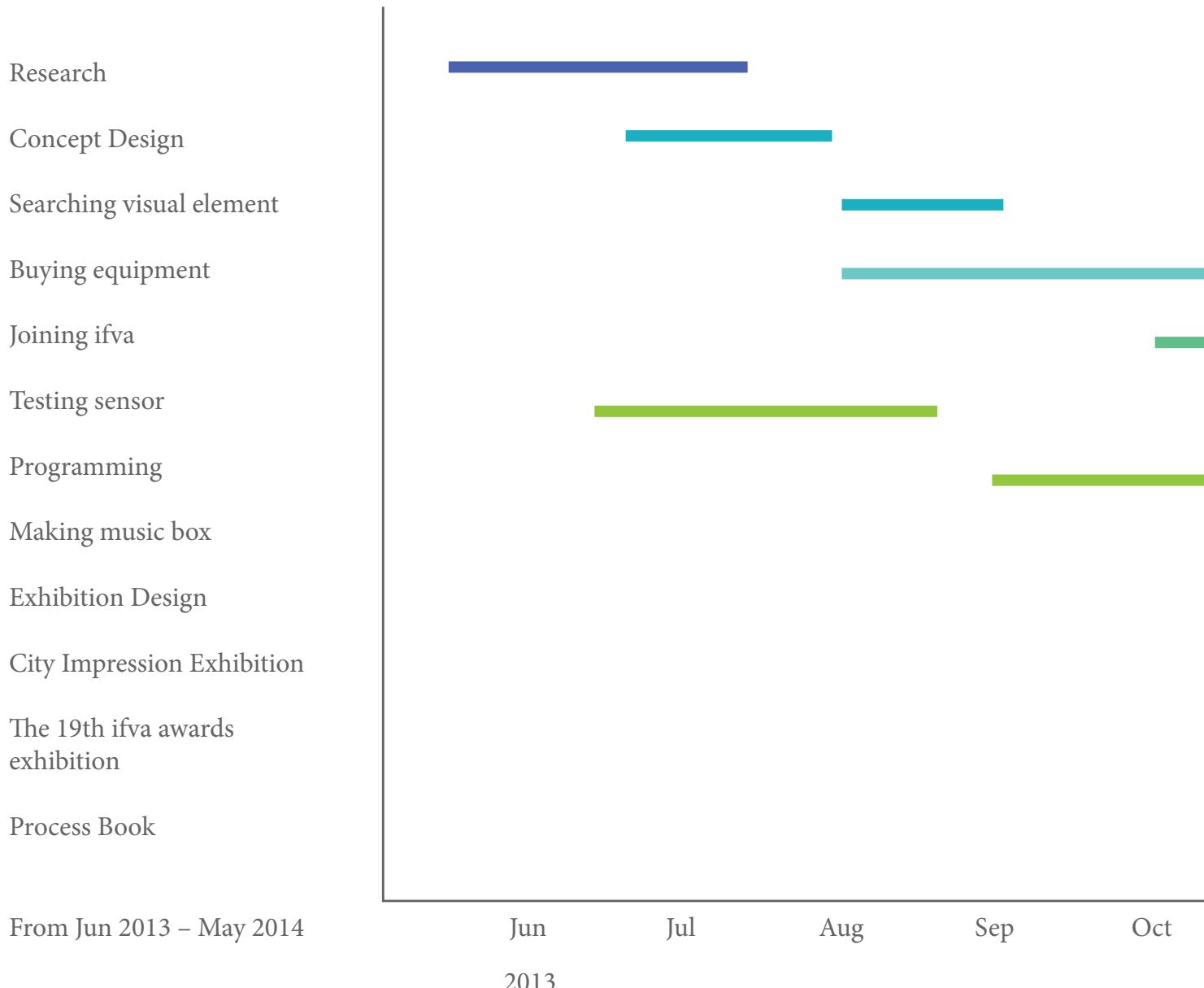


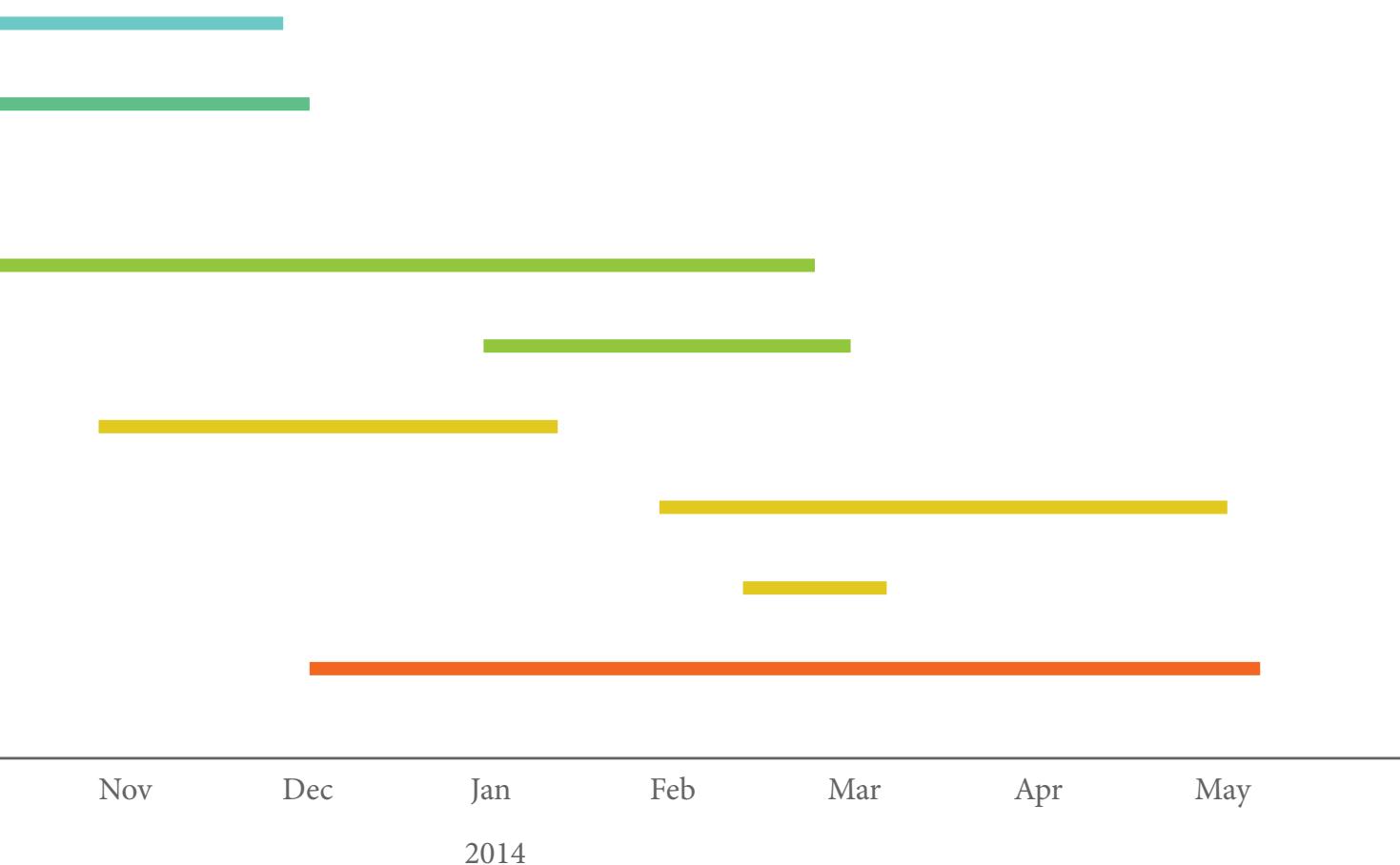
## Chai Wan Mei: Art & Design Festival 16/5-17/5 at Chai Wan District

Chai Wan Mei, an art and design festival, is organized by Pure Art Foundation. This showcase will be took place at the studio of Pure Art Foundation in Chai Wan District. After the ifva Awards, we are invited to join this festival to exhibit our work.

# Schedule









# Budget

Our installation can be divided into 3 parts:  
Projection, Music Box and Sensor

## Projection

Items	HKD
Projector	Rent from HKDI
iMac	Rent from HKDI
Mac VGA Display Port	218
<b>Sub-total</b>	<b>218</b>

## Music Box

Items	HKD
Music Box	3500
Tools	300
Relay	78
5m Arduino USB wire	23
Wire	63
Wood Board	60
Paper	10
<u>LED Light</u>	<u>420</u>
Battery	700
<b>Sub-total</b>	<b>5154</b>

Sensor	
Items	HKD
Mindwave Sensor	1280
Acrylic Stand	300
White cabinet	750
Alcohol Pads	125
<b>Sub-total</b>	<b>2455</b>

Total	
Items	HKD
Projection	218
Music Box	5154
Sensor	2455
<b>Total</b>	<b>7827</b>

## Minutes (Highlight)

Through out thousands of meetings we had in this project, the followings are the highlights of some important meetings.

HD in Creative Media (Interactive Media)  
Graduation Project (2013-2014)

Integrated Branching City Meeting

Date: 22 Jul 2013

Time: 13:00 -18:00

Venue: HKDI Zone 24

Present: Choi Ka Man, Fung Wing Lam, Kwok Wan Ting, Ngai Po Yiu

Agenda

- 1 - Setting aim
- 2 - Setting target group
- 3 - Concept brainstorm
- 4 - Other business
- 5 - Date and time of next meeting

### Item 1 - Setting aim

- 1.1 Choi remained our project background is about connection between people and city. She suggested that we don't have to completely follow the direction of city planning but something related to our society or culture.
- 1.2 Fung mentioned about the news of recent upset culture and feeling within our city.
- 1.3 Ngai suggested the topic of "Integration", encouraging public to listen different people's opinion and accept the variety in our city.
- 1.4 Others agreed and Kwok thought this is positive and suitable for the graduation project.

### Item 2 - Setting target group

- 2.1 Choi remained 2 areas of virtual research we choose to further develop: "Subconscious: Memory & Dream" for concept design and "Invisible to Visible" for visual base.
- 2.2 Kwok remained the project background can be about connectivity between people and the city where we can focus on a particular group of people.
- 2.3 Fung said since "Subconscious: Memory & Dream" is about the invisible part of human brain, maybe we can choose mental disorder patients, whose symptoms are also not physical appeared and related to the brain, as target group to inspire our concept.
- 2.4 Ngai agreed mental disorders can provide great room of imagination and creativity for designing the concept. She suggested doing a deeper research in different mental disorder.

#### Item 3 - Concept brainstorm

- 3.1 Fung suggested using white padded room of psychiatric hospital to create a special environment for the artwork and use shadow to simulate the busy life of city.
- 3.2 Ngai suggested using brainwave data as media and present the idea of integration by combining brainwave data of mental disorder patient and participants to create a city silhouette.
- 3.3 Others agreed brainwave will be an interesting media and concept to explore. Therefore, we agreed to do further research in brainwave data.

#### Item 4 - Other business

- 4.1 There was no other business.  
The meeting ended at 18:00.

#### Item 5 - Date and time of next meeting

- 5.1 Next meeting would be on 24 Jul 2013 at 13:30 to discuss about the findings of research.

HD in Creative Media (Interactive Media)  
Graduation Project (2013-2014)

Integrated Branching City Meeting

Date: 10 Sep 2013

Time: 14:30 -16:30

Venue: HKDI Zone 24

Present: Choi Ka Man, Fung Wing Lam, Kwok Wan Ting, Ngai Po Yiu

Agenda

- 1 - Meeting for target group research
- 2 - Buying sensor
- 3 - Setting visual elements
- 4 - Joining Ifva award
- 5 - Other business
- 6 - Date and time of next meeting

Item 1 - Meeting for target group research

- 1.1 Choi mentioned bipolar disorder is one of the urban diseases in Hong Kong.
- 1.2 Fung suggested focusing on bipolar disorder patients in our project and using the term of urban disease patients instead to raise the connection with our city.
- 1.3 Ngai suggested interviewing local professionals like psychiatrist or psychologist for more accurate information about our target group.
- 1.4 Kwok would ask our tutor to seek for the opportunity of interviewing professionals.

Item 2 - Buying sensor

- 2.1 Choi founded “Neurosky Mindwave Sensor” would be suitable for us to use in the project.
- 2.2 Ngai said “Neurosky Mindwave Sensor” was sold in an oversea company. She worried about it would take a long time for conveyance and delay our working schedule.
- 2.3 Fung found there was a shop in Mong Kwok that selling this sensor and solved the worry of long conveyance time.
- 2.4 All agreed to go buying the sensor together after the meeting.

### Item 3 - Setting visual elements

- 3.1 Ngai emphasized that the visual elements needed to be able for the participants to distinguish two different data and have combination to create a city-silhouette-liked image.
- 3.2 Fung suggested using horizontal and vertical lines to represent the data of bipolar disorder patients and participants respectively.
- 3.3 Kwok agreed as the combination of horizontal and vertical lines can create squares to form building-liked image.
- 3.4 Choi suggested using red, yellow and blue colour as main colour as these colour are more consider as friendly, enthusiastic and energetic, which can bring a positive impression for our installation.

### Item 4 - Joining Ifva award

- 4.1 Fung asked if we want to join a local competition that she found, called "The 19th ifva awards" which is suitable for our project to apply.
- 4.2 Ngai was very excited and expressed her hope of taking this chance to gain more experience in interactive media design.
- 4.3 Choi and Kwok agreed. Choi said it could bring a positive effect and greater intention for us to make this project better.
- 4.4 Fung said she would start the online application when she went back home.

Item 5 - Other business

- 5.1 There was no other business.  
The meeting ended at 16:30.

Item 6 - Date and time of next meeting

- 6.1 Next meeting would be on 15 Sep 2013 at 14:00 to try the brainwave sensor.

HD in Creative Media (Interactive Media)  
Graduation Project (2013-2014)

Integrated Branching City Meeting

Date: 8 Nov 2013

Time: 15:30 -17:00 (After meeting Mr. Nan)

Venue: HKDI Roof

Present: Choi Ka Man, Fung Wing Lam, Kwok Wan Ting, Ngai Po Yiu

Agenda

- 1 - Conclude key point from Mr. Nan
- 2 - Changing in visualization
- 3 - Improvement in sensoring
- 4 - Development in programming
- 5 - Other business
- 6 - Date and time of next meeting

### Item 1 - Conclusion of Mr. Nan's meeting

- 1.1 Ngai said it was not surprised but still felt pity that we were not able to meet local bipolar disorder patients since Mr. Nan mentioned those patients would never hope to expose their identity.
- 1.2 Fung said we might need to create a quieter environment in our installation to collect a more accurate after the consultation with Mr. Nan.
- 1.3 Choi also brought out the issue of creating a pre-visualization of the brain wave data of bipolar disorder patients since we were not able to collect the real data.
- 1.4 Kwok said she would upload the photos and videos to the Internet for others to revise the information from the interview.

### Item 2 - Changing in visualization

- 2.1 Choi suggested each member at least draw 1 set of pre-visualization to choose the one that can create the best visual effect in the program.
- 2.2 Ngai remained others that the pre-visualization also needed to contain a similarity or features of bipolar disorders' data, like range of fluctuation.
- 2.3 Fung suggested using graph papers, which would be easier for us to handle the data and have a more accurate testing result.
- 2.4 All agreed to buy graph papers and bring colour pencil for the testing in next meeting.

### Item 3 - Improvement in sensoring

- 3.1 Fung found a difficulty in connecting with the sensor when she was testing it at home.
- 3.2 Choi expressed a similar experience of difficulty especially after continuous testing of sensor.
- 3.3 Ngai suggested there might be the problem of grease from our face that blocking the contacting point between the mental sensoring tip and users' forehead, especially after continuous usage, the grease might accumulate on the tip and worsen the problem.
- 3.4 Kwok suggested using alcohol pad to clean and remove the grease from the tip before every usage of sensor to ensure a successful connection.
- 3.5 All agreed. Fung said it is practicable to have individual packing alcohol pad for participants in exhibition.

### Item 4 - Development in programming

- 4.1 Fung found there were 3 main data that can be collected from the sensor: Attention, Meditation and Signal.
- 4.2 Choi said she had researched about the meaning of other 8 data including delta, theta, alpha, beta and gamma, which in the interview Mr. Nan had mentioned about alpha is related to attention data, however it is too academic and too many professional scientific terms that we were not able to understand.
- 4.3 Fung suggested focusing attention data because it is the most stable and accurate data that can be collected from the sensor.
- 4.4 Ngai agreed and explained that attention data can symbolize the attention of the participants towards our city, thus, it is suitable for our project.

Item 5 - Other business

- 5.1 There was no other business.  
The meeting ended at 17:00.

Item 6 - Date and time of next meeting

- 6.1 Next meeting would be on 9 Nov 2013 at 11:00 to testing for new pre-visualization with graph paper.

HD in Creative Media (Interactive Media)  
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Integrated Branching City Meeting

Date: 14 Jan 2014 (Day after ifva site-visiting at Pao Galleries)

Time: 11:30 -17:00

Venue: HKDI 8/F

Present: Choi Ka Man, Fung Wing Lam, Kwok Wan Ting, Ngai Po Yiu

Agenda

- 1 - Conclusion of ifva measurement
- 2 - Changes in setting
- 3 - Testing of music box
- 4 - Other business
- 5 - Date and time of next meeting

#### Item 1 - Conclusion of ifva measurement

- 1.1 Fung expressed, among those two areas that provided for us, she think the area at the lower floor is more desirable as the darker lighting there is a more suitable environment for our projection.
- 1.2 Ngai did not completely agree with Fung as she thought the area at upper floor is larger and better for creating strong impression to the visitor.
- 1.3 Choi remained others that there would still be possibilities of change in area from ifva. She suggested telling ifva staff about our concern on projecting environment and wait for the confirmation of area.
- 1.4 Kwok agreed and said there might be hopes for a even better area for us.

#### Item 2 - Changes in setting

- 2.1 Choi said ifva would not provide support if we want to build a panoramic screen for the exhibition but we can change it into single screen projection.
- 2.2 Fung said it is not possible for us to build up a panoramic screen on our own and changing to single screen projection can also decrease the heavy workload in programming.
- 2.3 All agreed to change into single screen projection instead of using panoramic screen. Ngai said even though this may weaken the surrounding feeling impression of the original setting, this can be compensate with the lighting around to create the same feeling.

### Item 3 - Testing of music box

- 3.1 Fung said she tested the musical effect with an automatic music box is very desirable and suggested buying 12 music box from Chinese online market Taobao.
- 3.2 All agreed. Choi said it might need to testing the amount electricity needed and manage the wire well.
- 3.3 Fung reported problems of unable to connect Arduino with Max/msp and control the on and off of music box with arduino.
- 3.4 Kwok suggested finding Sun Sir and Lawrence to ask for solution.
- 3.5 Ngai also mentioned try to testing different types of paper as the music note sheet material for continuous looping and rolling in music box.
- 3.6 All agreed. Ngai would visit stationary shops to search for materials.

### Item 4 - Other business

- 4.1 There was no other business.  
The meeting ended at 17:00.

### Item 5 - Date and time of next meeting

- 5.1 Next meeting would be on 24 Jul 2013 at 13:30 to discuss about the findings of research.